



MULTIPURPOSE UNITS FOR 2/4 - PIPE SYSTEMS - Technical manual

NRP 0280-0750

REVERSIBLE HEAT PUMPS

- DESIGNED FOR 2 AND 4-PIPE SYSTEMS FOR EXTERNAL INSTALLATION
- OUTDOOR UNIT
- HIGH EFFICIENCIES

EN



Intertek



5 8 0 6 7 1 6 _ 0 3

INRP160HzTY. 1312. 5806716_03

Dear Customer,

Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies.

In addition, the EC mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability.

Product data may be subject to modifications deemed necessary for improving the product without the obligation to give prior notice.

Thank you again.
AERMEC S.p.A

NRP

MODEL	_____
SERIAL NUMBER	_____
DATE	_____

DECLARATION OF CONFORMITY

We, the undersigned, hereby declare under our own responsibility that the assembly in question, defined as follows:

NAME

NRP

TYPE

MULTI-PURPOSE UNIT

MODEL

To which this declaration refers, complies with the following harmonised standards:

CEI EN 60335-2-40

Safety standard regarding electrical heat pumps, air conditioners and dehumidifiers.

CEI EN 61000-6-1

Immunity and electromagnetic emissions for residential environments.

CEI EN 61000-6-3

Immunity and electromagnetic emissions for industrial environments.

CEI EN 61000-6-2

CEI EN 61000-6-4

EN378

Refrigerating system and heat pumps - Safety and environmental requirements.

UNI EN 12735

Seamless, round copper tubes for air conditioning and refrigeration.

UNI EN 14276

Pressure equipment for cooling systems and heat pumps.

Thereby, compliant with the essential requirements of the following directives:

- LVD Directive: 2006/95/CE
- Electromagnetic Compatibility Directive 2004/108/CE
- Machinery Directive 2006/42/CE
- PED Directive regarding pressurised devices 97/23/CE

The product, in agreement with Directive 97/23/CE, satisfies the Total quality Guarantee procedure (form H) with certificate no. 06/270-QT3664 Rev. 7 issued by the notified body n.1131 CEC via Pisacane 46 Legnano (MI) - Italy

The person authorised to constitute the technical file is: Pierpaolo Cavallo - 37040 Bevilacqua (VR) Italy – Rome, 996

Marketing Manager

Signature



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Standards and directives to be followed in the design and manufacture of the unit:

STANDARD

1. **UL 1995** Heating and cooling equipment
2. **ANSI/NFPA Standard 70** National Electrical code (N.E.C.)
3. **CSA C.22.1.- C.22.2** Safety Standard Electrical Installation

SAFETY LEVEL

1. IP24

ACOUSTIC PART

1. ISO DIS 9614/2 (sound intensity method)

REFRIGERANT GAS (R410A)

This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. Maintenance and disposal operations must be only carried out by qualified staff, in compliance with existing laws.



WARNING

Can not be excluded:

1. The only system side **COLD (NRP 4 PIPES)**
2. The only **SYSTEM SIDE (NRP 2 PIPES)**



ATTENTION

Tampering, removal, lack of the identification plate or other does not allow the safe identification of the product and will make any installation or maintenance operation to be performed difficult.

1. GENERAL WARNINGS

The NRP AERMEC units are constructed according to the recognised technical standards and safety regulations.

Multipurpose **OUTDOOR** units for 2 or 4 pipe systems, especially designed for simultaneous production of **cold** and **hot** water and fully independent.

Any contractual or extracontractual liability of the Company is excluded for injury/damage to persons, animals or objects owing to installation, regulation and maintenance errors or improper use. All uses not expressly indicated in this manual are prohibited.

1.1. PRESERVATION OF THE DOCUMENTATION

The instructions along with all the related documentation must be given to the user of the system, who assumes the responsibility to conserve the instructions so that they are always at hand in case of need.

Read this sheet carefully; the execution of all works must be performed by qualified staff, according to Standards in force on this subject in different countries. (Ministerial Decree 329/2004).

1.2. INSTALLATION

The unit must be installed in such a way that maintenance and/or repairs can be carried out.

1.3. WARRANTY

The appliance warranty does not cover the costs for ladder trucks, scaffolding, or other elevation systems that may become necessary for carrying out servicing under warranty.

Do not modify or tamper with the unit as dangerous situations can be created and the manufacturer will not be liable for any damage caused. The validity of the warranty shall be void in the event of failure to comply with the above-mentioned indications.

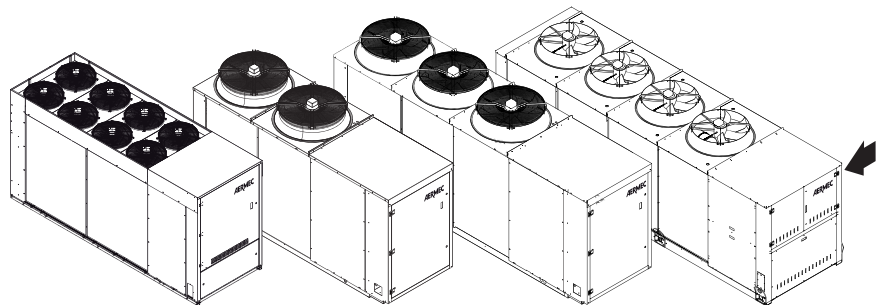
1.4. WARNINGS REGARDING SAFETY AND INSTALLATION STANDARDS

- The unit must be installed by a qualified and suitably trained technician, in compliance with the national legislation in force in the country of destination (Ministerial Decree 329/2004).
AERMEC will not assume any responsibility for damage due to failure to follow these instructions.
- Before beginning any operation, **READ THESE INSTRUCTIONS CAREFULLY AND CARRY OUT THE SAFETY CHECKS TO AVOID ALL RISKS.** All the staff involved must have thorough knowledge of the operations and any dangers that may arise at the moment in which the installation operations are carried out.

2. PRODUCT IDENTIFICATION

The units can be identified through:

- **PACKING LABEL** which shows the product identification data
- **TECHNICAL PLATE**



3. PRESENTATION

Multipurpose **OUTDOOR** units for 2 or 4 pipe systems, especially designed for simultaneous production of **cold** and **hot** water and fully independent.

AVAILABLE VERSIONS

3.1. FOR 2-PIPE SYSTEMS

The multipurpose 2-pipe units have been made for applications with 2 pipe terminals, e.g. hotels, where there is a cold/hot water and DHW demand throughout the year.

The operating modes are:

SUMMER FUNCTIONING

1. Cold water production to system.
2. Production of domestic hot water with use of total recovery (**NO ANTI-LEGIONELLA CYCLE**).

WINTER FUNCTIONING

3. Heat pump supplying the system.
4. Service heat pump of DHW.

3.2. FOR 4-PIPE SYSTEMS

The multipurpose 4-pipe units have been made for applications with 4 pipe terminals, e.g. shopping centres, offices or facilities with large windows where there can be the simultaneous demand for hot and cold water with a system which does not require season changeover and therefore is a valid alternative to traditional systems based on the chiller-boiler combination.

The microprocessor control logic ensures perfectly satisfying heat and cooling loads.

The operating modes are:

PRODUCTION OF COOLED WATER ONLY

The multipurpose unit acts as a classical refrigerator: cool water to the system and condensation heat disposal outside through finned coils.

PRODUCTION OF HOT WATER ONLY

The multipurpose unit acts as a heat pump, exploiting the heat of the outside air, through the finned coil (evaporator) it raises the temperature of the water to be sent to the system through a plate heat exchanger (condenser). The main difference from traditional cycle reverse heat pumps is that the heated water is produced in different heat exchanger from the one used to produce cold water.

This separates the two hot-cold sections required for 4-pipe systems.

COMBINED PRODUCTION

If the utility requires simultaneous hot and cold water, the unit acts as a water heat pump, controlling condensation and evaporation on two distinct plate heat exchangers associated to circulation of cold and hot water in the system. It automatically changes from one configuration to another (managed by on-board microprocessor) to optimise the spent energy depending on the demand by the utility.

Maximum reliability

Multi-circuit unit designed to provide the maximum efficiency both with full load and partial loads, guaranteeing operating continuity should one of the circuits stop to facilitate maintenance. Having several compressors and circuits ensures control of more steps of power yielded in both modes.

Built-in hydronic kit

Encloses the main hydraulic components; available in several configurations with high or low static pressure single pump or reserve pump (see configurator).

4. CECK LIST

COOLING CIRCUIT	2-pipe unit	4-pipe unit	COOLING CIRCUIT	2-pipe unit	4-pipe unit
Thermostatic valve (cooling mode)	•	•	High pressure switch (manually reset)	•	•
Thermostatic valve (recovery mode)	•	•	High pressure transducer	•	•
Cycle reverse valve	•	n.a.	Low pressure transducer	•	•
Recovery enable valve	•	•	Liquid indicator	•	•
Heat exchanger plate (Evaporator)	n.a.	•	Liquid tank	•	•
Heat exchanger plate (Evaporator/Condenser)	•	n.a.	One-way valves	•	•
Heat exchanger plate (DHW/Total Recovery)	•	•	Liquid separator	•	•
Air side coil exchanger	•	•	Solenoid valves	•	•
Compressor	•	•	Relief valves	•	•
Dehydrator filter	•	•			

KEY:

- As standard
- n.a. Not available

	2-pipe unit		4-pipe unit	
	System	Domestic hot water	Cooling side	Heat side
STANDARD HYDRAULIC CIRCUIT				
Filter	As per standard	As per standard	As per standard	As per standard
Flow switch	As per standard	As per standard	As per standard	As per standard
Air vent valve	As per standard	As per standard	As per standard	As per standard
CONFIGURABLE HYDRAULIC CIRCUIT				
VERSIONS WITH SYSTEM STORAGE TANK AND PUMPS (the more complete versions are described)				
Expansion vessel	As per standard	No	As per standard	No
System storage tank and pump/s	As per standard	No	As per standard	No
Drain tap	As per standard	No	As per standard	No
Safety valve	as per standard	No	As per standard	No
VERSIONS WITH PUMPS ONLY (the more complete versions are described)				
Pump/s	As per standard	As per standard	As per standard	As per standard
Expansion vessel	As per standard	As per standard	As per standard	As per standard
Safety valve	As per standard	As per standard	As per standard	As per standard

4.1. DESCRIPTION AND CHOICE OF THE UNIT

Field:

1 2 3	Code	NRP
4 5 6 7	Size	0280, 0300, 0330, 0350, 0500, 0550, 0600, 0650, 0700, 0750
8	Version	
	A	High efficiency (not available for sizes 0280÷0350)
	E	Silenced high efficiency (data on demand for sizes 0500÷0750)
9	Type of system:	
	2	2 pipe system (cooling + DHW heating)
	4	4 pipe system (cooling + heating)
10	Coil	
	°	Aluminium
	R	Copper
	S	Tinned copper
	V	Coated aluminium (epoxy paint)
11	Fan	
	I	Inverter
12	Power supply	
	6	230/3/60 with magnet circuit breakers
	7	460/3/60 with magnet circuit breakers
	8	575/3/60 with magnet circuit breakers
13 14	System side hydronic kit	
	00	Without hydronic kit
	01	Tank and single low head pump (not available for sizes 0800÷1800)
	02	Tank and single low head pump and reserve pump (not available for sizes 0800÷1800)
	03	Tank and single high head pump (not available for sizes 0800÷1800)
	04	Tank and single high head pump and reserve pump (not available for sizes 0800÷1800)
	P1	Single low head pump
	P2	Single low head pump and reserve pump
	P3	Single high head pump
	P4	Single high head pump and reserve pump
15 16	DHW side idronic kit ①	
	00	Without hydronic kit
	R1	Single low head pump
	R2	Single low head pump and reserve pump
	R3	Single high head pump
	R4	Single high head pump and reserve pump

① **DHW SIDE/SYSTEM SIDE**

DHW side, production of domestic hot water, in 2-pipe systems.
System side, production of hot water, in 4-pipe systems.

POSSIBLE CONFIGURATIONS BETWEEN HYDRONIC KITS

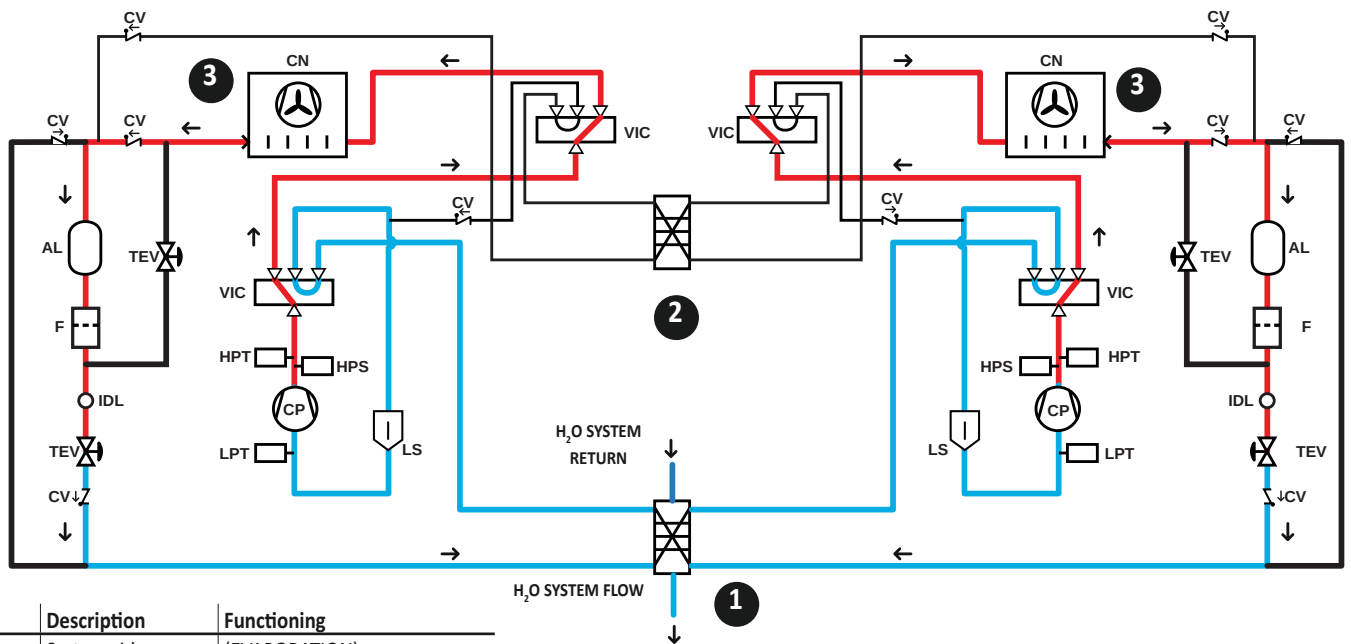
Recovery hydronic unit						
System hydronic unit		°	R1	R2	R3	R4
	°	●	●	●	●	●
	01	●	n.a.	n.a.	n.a.	n.a.
	02	●	n.a.	n.a.	n.a.	n.a.
	03	●	n.a.	n.a.	n.a.	n.a.
	04	●	n.a.	n.a.	n.a.	n.a.
	05	●	n.a.	n.a.	n.a.	n.a.
	06	●	n.a.	n.a.	n.a.	n.a.
	07	●	n.a.	n.a.	n.a.	n.a.
	08	●	n.a.	n.a.	n.a.	n.a.
	P1	●	●	●	●	●
	P2	●	●	●	●	●
	P3	●	●	●	●	●
	P4	●	●	●	●	●

KEY:

• Available
n.a. Not available

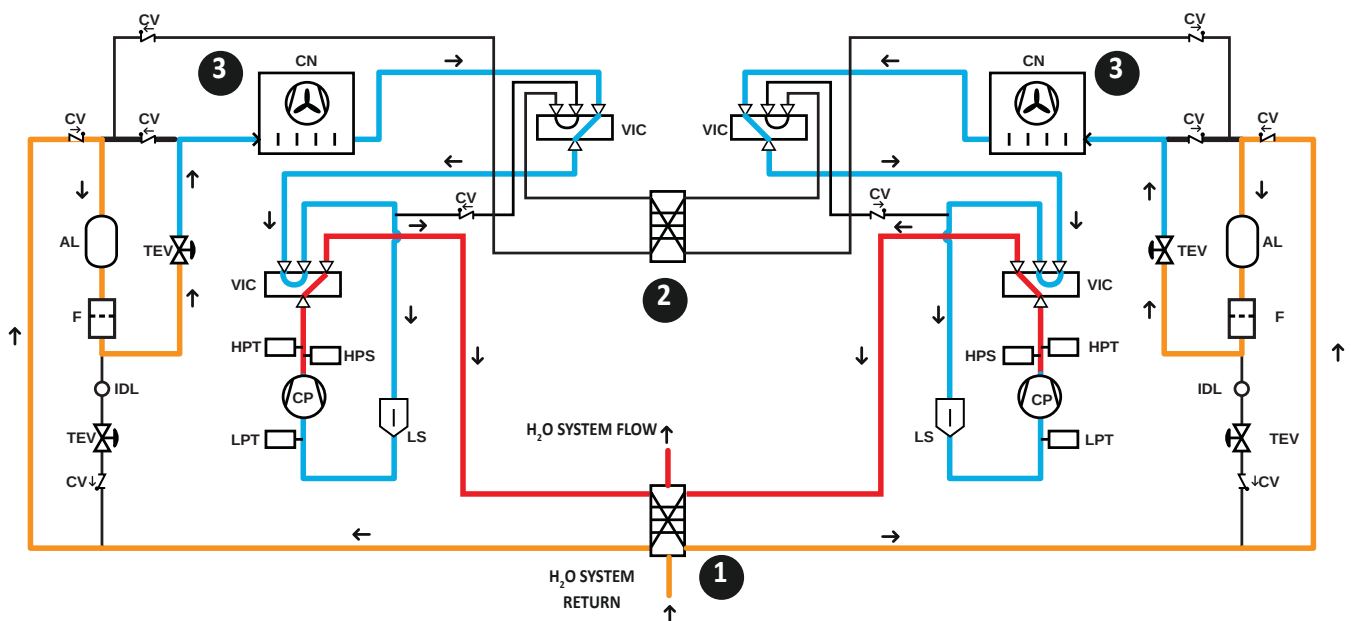
5. BASIC OPERATING LAYOUT FOR 2-PIPE SYSTEM

COLD WATER PRODUCTION ONLY TO SYSTEM



	Description	Functioning
1	System side HEAT EXCHANGER	(EVAPORATION) Cold water production
2	DHW side HEAT EXCHANGER	Not running
3	Source side HEAT EXCHANGER	(CONDENSATION) Heat exchange with air

HOT WATER PRODUCTION ONLY TO SYSTEM

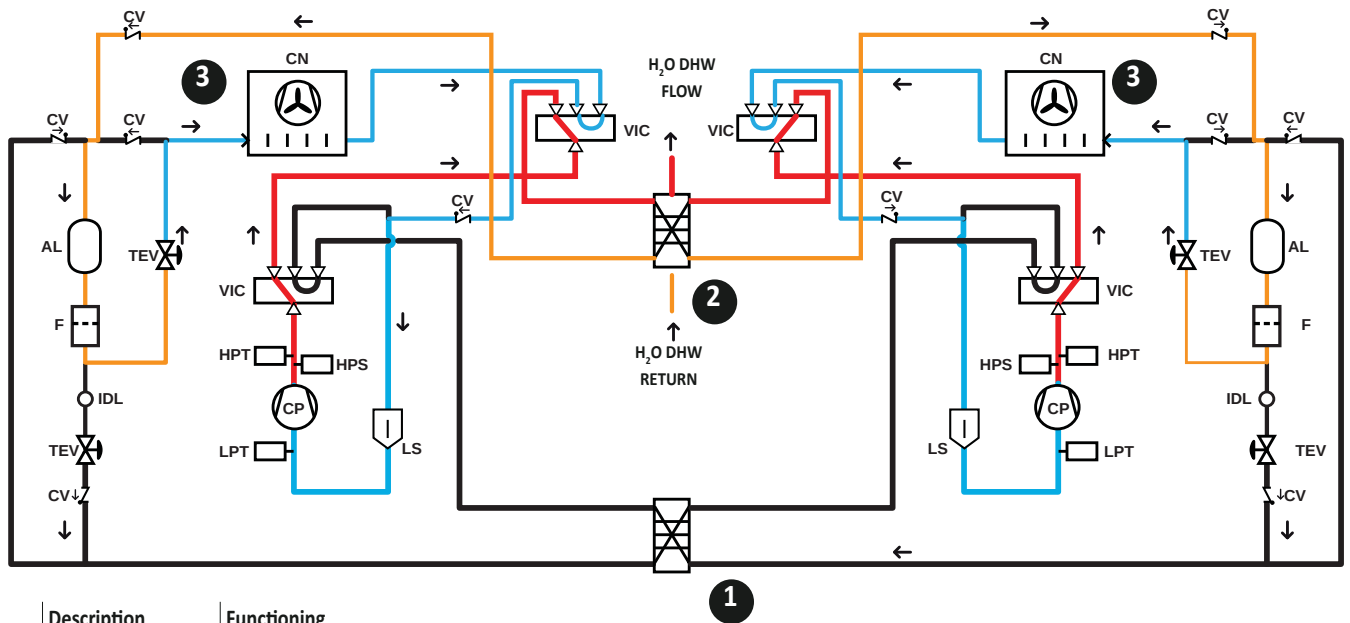


	Description	Functioning
1	System side HEAT EXCHANGER	(CONDENSATION) Hot water production
2	DHW side HEAT EXCHANGER	Not running
3	Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

	Key
1	System side heat exchanger
2	DHW side heat exchanger
3	Source side heat exchanger
AL	Liquid storage tank
CV	One-way valve
F	Dehydrator filter

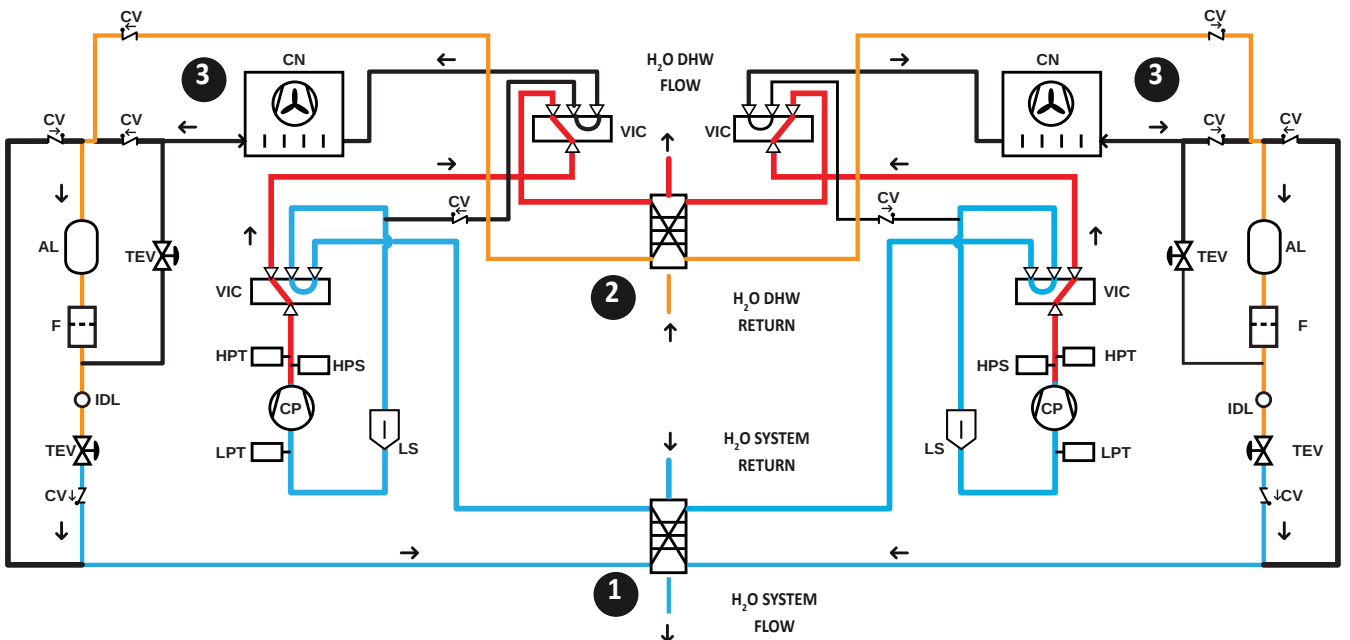
IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

2 CIRCUITS TO PRODUCE HOT WATER ONLY TO DHW



	Description	Functioning
1	System side HEAT EXCHANGER	Not running
2	DHW side HEAT EXCHANGER	(CONDENSATION) DHW production
3	Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

2 CIRCUITS TO PRODUCE COLD WATER TO SYSTEM AND HOT WATER TO DHW

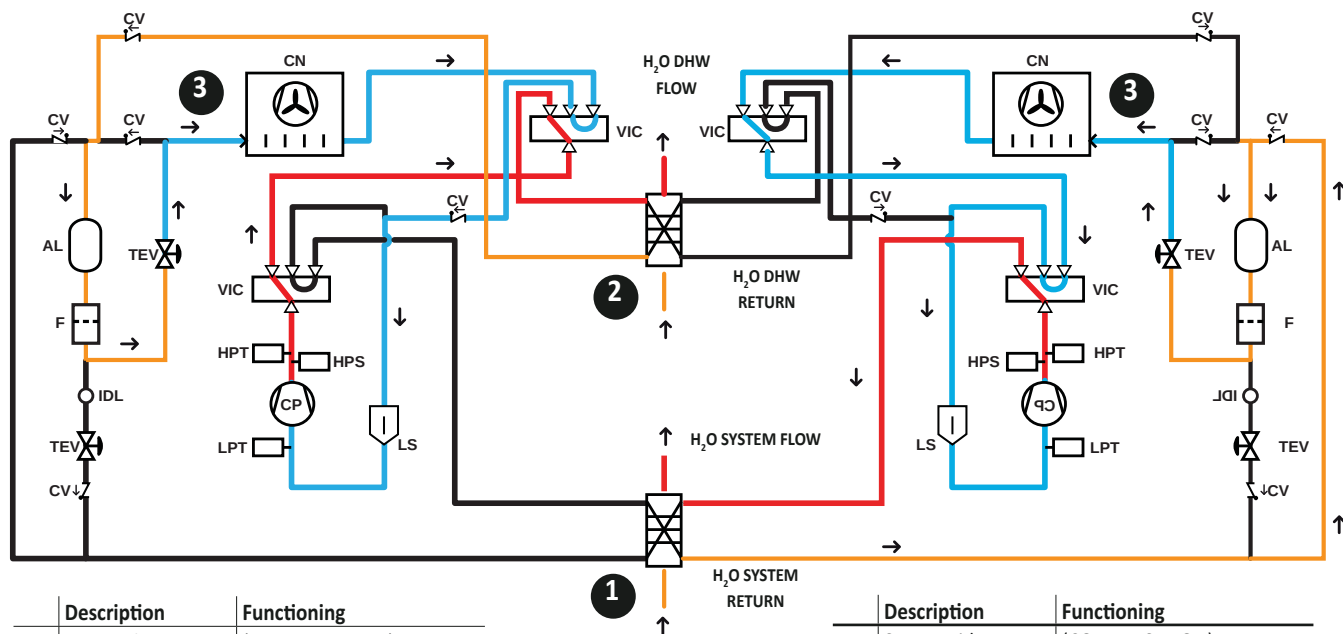


	Description	Functioning
1	System side HEAT EXCHANGER	(EVAPORATION) Cold water production
2	DHW side HEAT EXCHANGER	(CONDENSATION) DHW production
3	Source side HEAT EXCHANGER	Not running

	Key
1	System side heat exchanger
2	DHW side heat exchanger
3	Source side heat exchanger
AL	Liquid storage tank
CV	One-way valve
F	Dehydrator filter

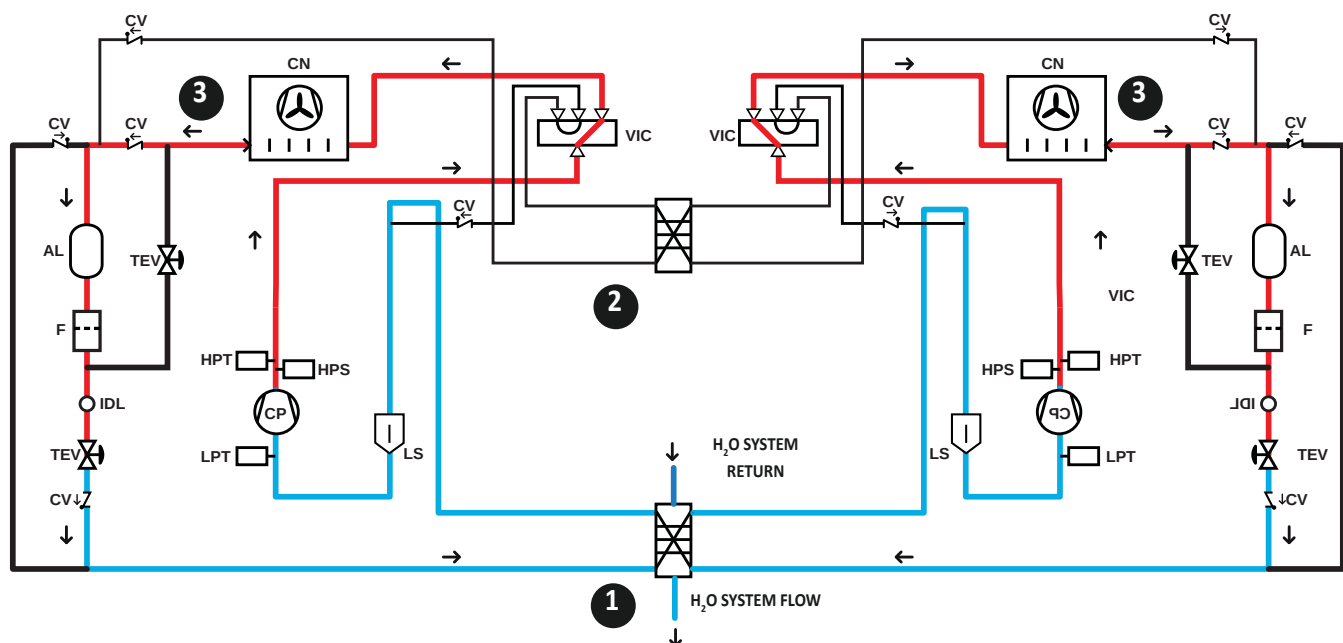
IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

CIRCUIT FOR PRODUCING HOT WATER TO SYSTEM | CIRCUIT FOR PRODUCING HOT WATER TO DHW



6. BASIC OPERATING LAYOUT FOR 4-PIPE SYSTEM

COLD WATER PRODUCTION ONLY TO SYSTEM

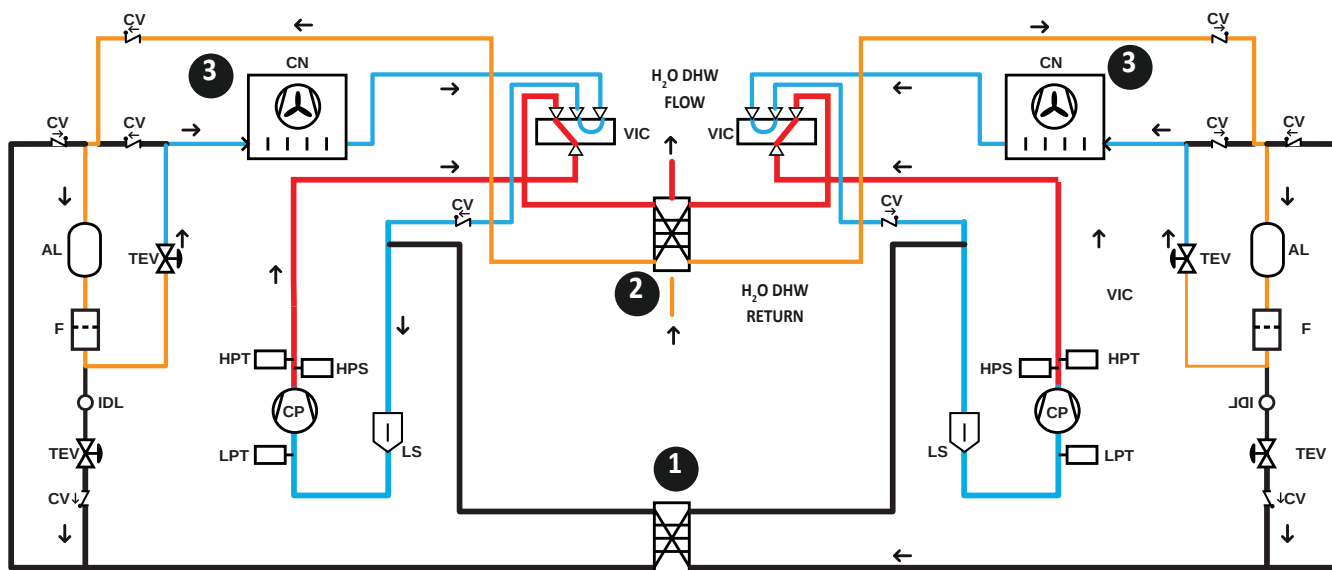


Description	Functioning
1 System side HEAT EXCHANGER	(EVAPORATION) Cold water production
2 DHW side HEAT EXCHANGER	Not running
3 Source side HEAT EXCHANGER	(CONDENSATION) Heat exchange with air

Key
1 System side heat exchanger
2 DHW side heat exchanger
3 Source side heat exchanger
AL Liquid storage tank
CV One-way valve
F Dehydrator filter

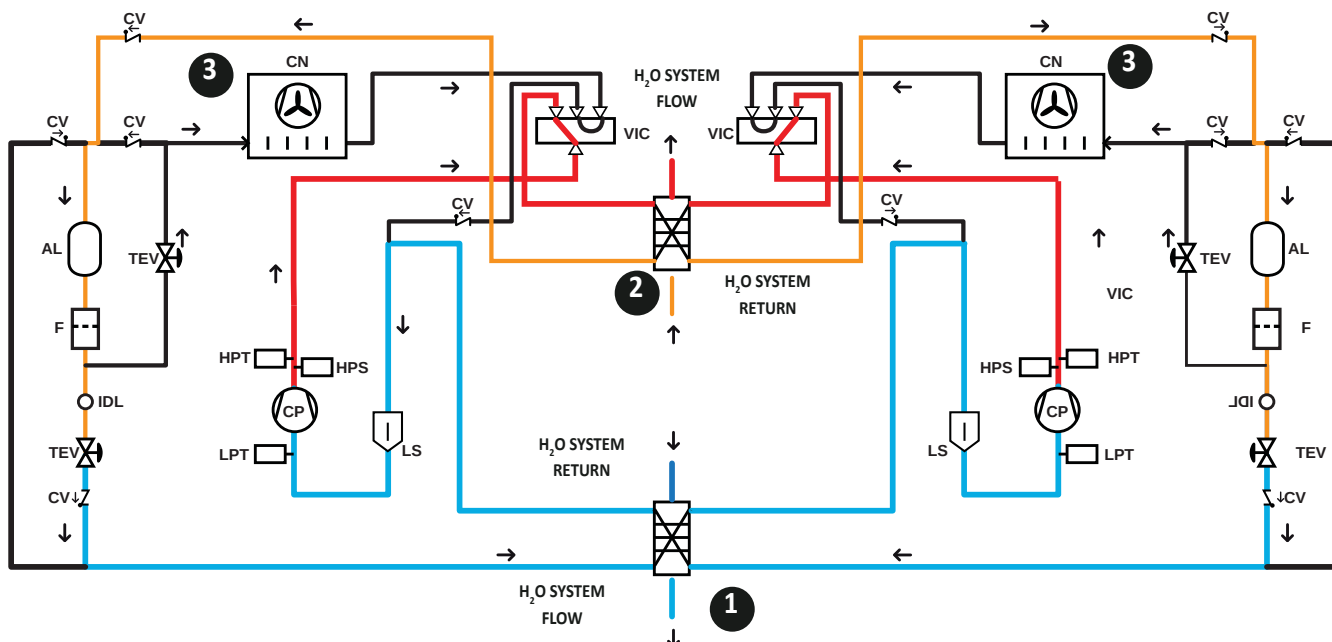
IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

HOT WATER PRODUCTION ONLY TO SYSTEM



	Description	Functioning
1	Cooling side EXCHANGER	Not running
2	Heating side EXCHANGER	(CONDENSATION) Hot water production
3	Source side HEAT EXCHANGER	(EVAPORATION) Heat exchange with air

SIMULTANEOUS HOT AND COLD WATER PRODUCTION TO SYSTEM



	Description	Functioning
1	Cooling side EXCHANGER	(EVAPORATION) Cold water production
2	Heating side EXCHANGER	(CONDENSATION) Hot water production
3	Source side HEAT EXCHANGER	Not running

	Key
1	System side heat exchanger
2	DHW side heat exchanger
3	Source side heat exchanger
AL	Liquid storage tank
CV	One-way valve
F	Dehydrator filter

IDL	Liquid indicator
HPT	High pressure transducer
HPS	High pressure pressure switch
LPT	Low pressure transducer
LS	Liquid separator
TEV	Thermostatic valves
VIC	Cycle reversing valve

7. DESCRIPTION OF COMPONENTS

7.1. STRUCTURE

BASEAND SUPPORT STRUCTURE

Made up from hot galvanised sheet steel elements with suitable thickness. All parts painted with polyester powder paints (RAL 9002), resistant to atmospheric agents.

Realised in a way to allow total accessibility to the components internal components. All panels are covered with sound-absorbent material with suitable thickness.

7.2. COOLING CIRCUIT

COMPRESSOR

Hermetic scroll rotary compressors. All compressors come with casing resistance, electronic thermal protection with centralised manual resetting and two-pole electric motor.

COOLING/HEATING EXCHANGER SYSTEM SIDE

Braze welded AISI 316 steel plate heat exchanger, insulated externally with closed cell neoprene anti-condensation material. When the unit is not running, it is protected against formation of ice inside by an electric resistance.

7.3. WATER FEATURES

PH	6-8
Electric conductivity	Less than 200 mV/cm (25°C)
Chloride ions	Less than 50 ppm
Sulphuric acid ions	Less than 50 ppm
Total iron	Less than 0.3 ppm
Alkalinity M	Less than 50 ppm
Total hardness	Less than 50 ppm
Sulphur ions	None
Ammonia ions	None
Silicone ions	Less than 30 ppm

DHW SIDE HEAT EXCHANGER (2 pipes) HEATING SIDE SYSTEM (4 pipes)

Braze welded AISI 316 steel plate heat exchanger, insulated externally with closed cell neoprene anti-condensation material. When the unit is not running, it is protected against formation of ice inside by an electric resistance.

AIR SIDE COIL EXCHANGER

Finned pack heat exchanger made with copper pipes and aluminium fins adequately spaced to ensure better heat exchange performance.

CYCLE REVERSING VALVE (2 PIPE)

4-way cycle reversing valve. Inverts the flow of refrigerant gas.

RECOVERY ENABLE VALVE

4-way valve enables the recovery heat exchanger.

LIQUID STORAGE TANK

(always passed by)

Compensates the difference in volume between finned coil and plate exchanger, retaining excess liquid.

LIQUID SEPARATOR

Located on the suction point of the compressor, to protect against any flowback of liquid refrigerant, flooded start-ups, operation in the presence of liquid.

DEHYDRATOR FILTER

Hermetic-mechanical with cartridges made of ceramic and hygroscopic material, able to withhold impurities and any traces of humidity present in the cooling circuit.

ONE WAY VALVES

Allows one-way flow of the refrigerant.

THERMOSTATIC VALVES

Two valves installed:

(cooling mode and recovery mode)

Mechanical valves, with external equaliser positioned at evaporator outlet, modulates the flow of gas to the evaporator, depending on the heat load, in order to ensure a correct heating level of the intake gas.

SOLENOID VALVES

The valve closes when the compressor switches off, blocking the flow of refrigerant gas to the evaporator, recovery and the coil.

INDICATOR FOR LIQUID

Used to check presence of humidity in cooling circuit.

7.4. STANDARD HYDRAULIC CIRCUIT

WATER FILTERS

Equipped with steel filtering mesh, prevents the heat exchangers both of the system side and the DHW/heating system side from clogging.

FLOW SWITCHES

They have the task of controlling that there is water circulation inside the heat exchangers; if this is not the case, they block the unit.

AIR VENT VALVE

Mounted on the top of the hydraulic system; they discharge possible air pockets.

7.4.1. COMPONENTS OF HYDRAULIC CIRCUIT IN CONFIGURABLE VERSIONS

PUMPS

High or low static pressure.

EXPANSION VESSEL

With nitrogen pre-load membrane.

SAFETY VALVE

Equipped with a piped discharger, intervenes by discharging the over pressure in case of anomalous pressures.

SYSTEM STORAGE TANK

Made of steel to reduce heat loss and to eliminate the formation of condensation, insulated by thick polyurethane.

DRAIN TAP

7.5. SAFETY AND CONTROL COMPONENTS

MANUALLY RESET HIGH PRESSURE SWITCH

With fixed calibration, placed on high pressure side of cooling circuit, inhibits functioning of compressor if abnormal work pressure occurs.

LOW PRESSURE TRANSDUCER

Placed on the low pressure side of the cooling

circuit, it signals the work pressure to the control board generating a pre-warning in the case of anomalous pressures.

HIGH PRESSURE TRANSDUCER

Placed on the high pressure side of the cooling circuit, it signals the work pressure to the control board generating a pre-warning in the case of anomalous pressures.

RELIEF VALVES

They intervene by discharging the overpressure in the case of anomalous pressures.

- Calibrated at 45 bar on HP branch.

- Calibrated at 30 bar on LP branch.

CONDENSATION PRESSURE CONTROLLER

This device allows correct functioning with external temperatures lower than 10°C and as low as -10°C.

It consists of an adjustment circuit board that varies the number of fan revs according to the condensation pressure read by the high pressure transducer, in order to keep it sufficiently high for correct unit functioning.

It also allows correct functioning in heating mode with external temperatures exceeding 30°C and up to 42°C.

7.6. ELECTRIC CONTROL AND POWER BOARD

Electric board in compliance with standards UL1995, EN 60204-1/IEC 204-1, complete with:

- transformer for the control circuit,
- door lock main isolating switch,
- fuses and contactors for compressors and fans,
- terminals for REMOTE PANEL,
- spring type control circuit terminal board,
- outdoor electric board with double door and gaskets,
- electronic controller,
- evaporator pump and recovery pump control consent relay (only for versions without pump units),
- all numbered cables.

DOOR-LOCK ISOLATING SWITCH

The electric control board can be accessed by removing the voltage. Act on the opening lever of the control board itself. This lever can be locked using one or more padlocks during maintenance interventions to prevent the machine being powered up accidentally.

CONTROL BOARD

1. Allows the complete control of the appliance. For a more in-depth description please refer to the user manual.valve and ON/OFF pumps.
2. Production of DHW through a 3-way diverter valve or the total recovery version.

Additional functions:

- Control of an external integration resource dedicated to DHW.



ATTENTION

For questions of space, in configurations with storage tank and built-in pump/s on the system side, no pumps can be available on the recovery side!

8. ACCESSORIES

8.1. MECHANICAL ACCESSORIES

VT ANTI-VIBRATION MOUNTS

Group of anti-vibration mounts.

GP PROTECTION GRIDS

Protect the external coil from blows and prevent access to the underlying area where the compressors and the chiller circuit are housed. Every kit includes two grids.

TRX1

The storage tanks with holes and integrative resistances are delivered from the factory with plastic protective caps. Before the system is loaded, the plastic caps must be replaced with the specific TRX1 if installation of one or all the resistances is not foreseen.

8.2. ELECTRIC ACCESSORIES

AER485P1

RS-485 interface for supervising systems with MODBUS protocol.

AERWEB300

Accessory AERWEB allows remote control of a chiller through a common PC and an ethernet connection over a common browser; 4 versions available:

AERWEB300-6: Web server to monitor and remote control max. 6 units in RS485 network;

AERWEB300-18: Web server to monitor and remote control max. 18 units in RS485 network;

AERWEB300-6G: Web server to monitor and remote control max. 6 units in RS485 network with integrated GPRS modem;

AERWEB300-18G: Web server to monitor and remote control max. 18 units in RS485 network with integrated GPRS modem;

PGD1

Graphical display, which allows complete management of the unit like the one on board the machine. Can be controlled up to 50 m away with a telephone cable, 200 m with a shielded AWG 24 cable.

RIF

Current rephaser. Connected in parallel to the motor, it allows a reduction of the input current (approx. 10%). It can only be installed in the factory and so must be requested on ordering.

NRP	VERSION	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
MECHANICAL ACCESSORIES											
VT	00										
	P1-P2-P3-P4 R1-R2-R3-R4	17	17	17	17	13	13	13	13	22	23
	01-02-03-04	13	13	13	13	10	10	10	10	22	23
GP	A	-	-	-	-	GP2x2	GP2x2	GP2x2	GP2x2	GP2x3	GP10x3
	E	GP3	GP4	GP4	GP4	GP2x2	GP2x2	GP2x2	GP2x2	GP2x3	GP10x3
TRX1	ALL	•	•	•	•	•	•	•	•	•	•
ELECTRIC ACCESSORIES											
DRE	ALL	281	301	331	351	501	551	601	651	701	751
RIF *	ALL	•	•	•	•	•	•	•	•	•	•
AER485P1	ALL	•	•	•	•	•	•	•	•	•	•
PGD1	ALL	•	•	•	•	•	•	•	•	•	•
AERWEB300-6	ALL	•	•	•	•	•	•	•	•	•	•
AERWEB300-18	ALL	•	•	•	•	•	•	•	•	•	•
AERWEB300-6G	ALL	•	•	•	•	•	•	•	•	•	•
AERWEB300-18G	ALL	•	•	•	•	•	•	•	•	•	•

* Please contact us.

9. TECHNICAL DATA

Model			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
COOLING MODE												
Cooling capacity	A	ton	-	-	-	-	22,73	26,83	32,65	37,03	41,16	44,93
	E	ton	12,32	14,13	16,21	20,29	data on demand					
Input power	A	kW	-	-	-	-	28,40	33,67	40,62	46,30	51,78	56,01
	E	kW	15,25	17,65	20,05	25,42	data on demand					
Water flow rate	A	gpm	-	-	-	-	54,43	64,26	78,19	88,69	98,58	107,61
	E	gpm	29,51	33,85	33,83	48,60	data on demand					
Total pressure drops SYSTEM SIDE	A	PSI	-	-	-	-	2,03	2,47	4,64	9,60	6,36	4,79
	E	PSI	1,74	2,18	2,18	2,47	data on demand					
Available static pressure Low static pressure pump	A	PSI	-	-	-	-	18,59	16,69	23,40	21,34	18,70	20,45
	E	PSI	21,99	21,19	20,89	19,52	data on demand					
Available static pressure High static pressure pump	A	PSI	-	-	-	-	29,01	27,30	35,29	33,21	30,51	32,18
	E	PSI	31,53	30,94	30,84	29,79	data on demand					
HEATING MODE												
Heating capacity	A	BTU/h	-	-	-	-	328258	381646	479474	536314	590505	660103
	E	BTU/h	184010	213353	242695	304776	data on demand					
Input power	A	kW	-	-	-	-	31,01	36,53	46,58	51,18	56,58	63,51
	E	kW	17,24	19,94	22,65	27,32	data on demand					
Water flow rate	A	gpm	-	-	-	-	73	85	106	119	131	147
	E	gpm	41	47	54	68	data on demand					
Pressure drops SYSTEM SIDE VERS. 2 PIPES	A	PSI	-	-	-	-	3,3	4,0	6,9	7,9	9,7	7,2
	E	PSI	2,8	3,4	3,4	3,9	data on demand					
Pressure drops DHW SIDE/SYSTEM SIDE ¹	A	PSI	-	-	-	-	5,1	8,1	10,0	10,0	9,0	6,9
	E	PSI	3,2	5,1	5,2	4,2	data on demand					
ENERGY INDEX												
EER	A	BTU/W	-	-	-	-	9,61	9,57	9,65	9,61	9,55	9,64
	E	BTU/W	9,71	9,62	9,71	9,59	data on demand					
COP	A	W/W	-	-	-	-	3,10	3,06	3,02	3,07	3,06	3,05
	E	W/W	3,13	3,14	3,14	3,27	data on demand					

- ¹ **DHW SIDE/SYSTEM SIDE**
DHW side, production of domestic hot water, in 2-pipe systems.
System side, production of hot water, in 4-pipe systems.

① COOLING CONDITIONS: AHRI STANDARD

System water outlet	6,7°C - 44,06°F
System water flow	0,043 l/s per kW
External air temperature	35°C - 95°F

② HEATING CONDITIONS:

DHW / System water inlet	40°C - 104°F
DHW / System water outlet	45°C - 113°F
External air temperature d.b./w.b.	7/6°C - 44,6°F/42,8

Model			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
TOTAL RECOVERY MODE												
Cooling capacity	A	ton	-	-	-	-	20,64	24,57	29,92	34,01	37,89	41,60
	E	ton	11,17	13,19	15,12	19,38	data on demand					
Recovered capacity	A	ton	-	-	-	-	27,38	33,41	40,94	46,36	51,66	56,76
	E	ton	15,14	17,89	20,55	26,05	data on demand					
Total input power	A	kW	-	-	-	-	24,94	32,75	40,80	45,70	51,00	56,10
	E	kW	14,69	17,39	20,10	24,70	data on demand					
TER - Total Efficiency Ratio	-	W/W	6,30	6,28	6,24	6,47	6,77	6,23	6,11	6,18	6,18	6,17
Water flow rate Evaporator	A	gpm	-	-	-	-	49,48	58,89	71,71	81,53	90,82	99,72
	E	gpm	26,77	31,62	36,25	46,46	data on demand					
Evaporator pressure drops SYSTEM SIDE	A	PSI	-	-	-	-	1,92	2,46	3,90	4,62	5,73	4,14
	E	PSI	1,44	1,95	1,84	2,27	data on demand					
Recovery water flow rate	A	gpm	-	-	-	-	72,92	88,99	109,03	123,46	137,60	151,16
	E	gpm	40,32	47,64	54,74	69,39	data on demand					
Recovery pressure drops DHW SIDE/SYSTEM SIDE ¹	A	PSI	-	-	-	-	5,08	9,00	10,48	10,77	9,88	7,49
	E	PSI	3,04	5,11	5,33	4,38	data on demand					
TOTAL RECOVERY MODE - SYSTEM SIDE PUMP												
Available static pressure	A	PSI	-	-	-	-	19,6	18,0	24,8	23,0	20,8	22,2
Low static pressure pump (230-460V)	E	PSI	22,5	21,6	21,4	20,0	data on demand					
Available static pressure	A	PSI	-	-	-	-	21,6	19,0	24,8	23,0	20,8	22,2
Low static pressure pump (575V)	E	PSI	26,6	25,4	24,7	22,3	data on demand					
Available static pressure	A	PSI	-	-	-	-	30,0	28,4	36,7	34,9	32,7	34,0
High static pressure pump (230-460V)	E	PSI	31,9	31,3	31,2	30,2	data on demand					
Available static pressure	A	PSI	-	-	-	-	28,1	27,0	36,7	34,9	32,7	34,0
High static pressure pump (575V)	E	PSI	32,6	31,5	31,0	28,7	data on demand					
TOTAL RECOVERY MODE - DHW / SYSTEM SIDE PUMP												
Available static pressure	A	PSI	-	-	-	-	23,6	18,6	14,7	23,7	21,9	22,3
Low static pressure pump (230-460V)	E	PSI	20,0	17,3	16,3	15,2	data on demand					
Available static pressure	A	PSI	-	-	-	-	23,6	18,6	14,7	23,7	21,9	22,3
Low static pressure pump (575V)	E	PSI	23,0	19,5	17,7	15,1	data on demand					
Available static pressure	A	PSI	-	-	-	-	35,5	30,5	35,5	32,9	31,2	31,8
High static pressure pump (230-460V)	E	PSI	30,0	27,5	26,7	25,9	data on demand					
Available static pressure	A	PSI	-	-	-	-	35,5	30,5	35,5	32,9	31,2	31,8
High static pressure pump (575V)	E	PSI	29,3	25,9	24,1	21,0	data on demand					

- 1 **DHW SIDE/SYSTEM SIDE**
DHW side, production of domestic hot water, in 2-pipe systems.
System side, production of hot water, in 4-pipe systems.

③ TOTAL RECOVERY CONDITIONS:

System heat exchanger

Water outlet 6,7°C / 44,06°F
Water flow 0,043 l/s per kW

DHW / System heat exchanger

Water inlet 40°C / 104°F
Water outlet 45°C / 113°F

Model			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
ELECTRICAL DATA: 230V-3-60HZ POWER SUPPLY												
Input current (cooling mode)		A	61,74	68,90	78,38	98,71	101,57	119,57	150,59	168,49	186,13	209,85
Input current (total recovery mode)		A	48,11	64,33	71,34	86,50	91,55	108,74	130,97	160,00	177,60	192,72
Input current (heating mode)		A	65,75	74,14	88,98	103,92	106,48	122,84	166,68	181,97	199,30	222,06
NO PUMP VERSION												
LRA		A	239,31	287,31	293,74	374,74	376,43	389,29	372,93	453,93	493,93	546,43
MCA		A	86,71	94,74	101,17	146,17	147,86	160,71	180,36	225,36	265,36	284,11
MOP		A	117,42	131,89	138,31	203,31	205,00	217,86	217,50	282,50	322,50	346,25
Recommended fuse		A	110,00	125,00	125,00	200,00	200,00	200,00	200,00	250,00	300,00	300,00
SYSTEM + DHW/SYSTEM LOW HEAD PUMPS												
LRA		A	254,33	302,33	308,76	389,76	391,74	404,60	388,53	471,73	511,73	564,23
MCA		A	101,73	109,76	116,19	161,19	163,17	176,02	195,96	243,16	283,16	301,91
MOP		A	132,44	146,91	153,33	218,33	220,31	233,17	233,10	300,30	340,30	364,05
Recommended fuse		A	125,00	125,00	150,00	200,00	200,00	225,00	225,00	300,00	300,00	350,00
SYSTEM + DHW/SYSTEM HIGH HEAD PUMPS												
LRA		A	254,91	302,91	309,34	390,34	394,23	407,09	396,13	477,13	517,13	569,63
MCA		A	102,31	110,34	116,77	161,77	165,66	178,51	203,56	248,56	288,56	307,31
MOP		A	133,02	147,49	153,91	218,91	222,80	235,66	240,70	305,70	345,70	369,45
Recommended fuse		A	125,00	125,00	150,00	200,00	200,00	225,00	225,00	300,00	300,00	350,00
ELECTRICAL DATA: 460V-3-60HZ POWER SUPPLY												
Input current (cooling mode)		A	39,56	43,12	46,68	54,30	49,07	58,02	69,66	77,76	85,74	96,98
Input current (total recovery mode)		A	23,94	32,01	32,28	39,14	43,61	52,15	65,16	72,40	80,36	90,84
Input current (heating mode)		A	41,56	45,73	49,90	56,66	51,37	59,51	76,94	83,86	91,70	106,14
NO PUMP VERSION												
LRA		A	131,89	156,89	162,60	192,60	188,57	200,00	198,90	228,90	238,90	276,09
MCA		A	49,74	56,89	62,60	73,85	69,82	81,25	98,90	110,15	120,15	133,69
MOP		A	64,03	76,89	82,60	98,85	94,82	106,25	118,90	135,15	145,15	162,98
Recommended fuse		A	60,00	75,00	80,00	90,00	90,00	100,00	110,00	125,00	125,00	150,00
SYSTEM + DHW/SYSTEM LOW HEAD PUMPS												
LRA		A	140,47	165,47	171,18	201,18	196,76	208,19	206,70	237,80	247,80	284,99
MCA		A	58,32	65,47	71,18	82,43	78,01	89,44	106,70	119,05	129,05	142,59
MOP		A	72,61	85,47	91,18	107,43	103,01	114,44	126,70	144,05	154,05	171,88
Recommended fuse		A	70,00	80,00	90,00	100,00	100,00	110,00	125,00	125,00	150,00	150,00
SYSTEM + DHW/SYSTEM HIGH HEAD PUMPS												
LRA		A	140,89	165,89	171,60	201,60	198,07	209,50	210,50	240,50	250,50	287,69
MCA		A	58,74	65,89	71,60	82,85	79,32	90,75	110,50	121,75	131,75	145,29
MOP		A	73,03	85,89	91,60	107,85	104,32	115,75	130,50	146,75	156,75	174,58
Recommended fuse		A	70,00	80,00	90,00	100,00	100,00	110,00	125,00	125,00	150,00	150,00
ELECTRICAL DATA: 575V-3-60HZ POWER SUPPLY												
Input current (cooling mode)		A	34,50	37,24	39,99	45,86	38,00	44,91	53,99	60,23	66,37	75,14
Input current (total recovery mode)		A	18,42	24,64	24,86	30,14	33,56	40,16	50,17	55,75	61,88	69,95
Input current (heating mode)		A	36,03	39,25	42,47	47,68	39,77	46,06	59,59	64,92	70,96	82,20
NO PUMP VERSION												
LRA		A	102,75	104,75	108,33	145,18	138,37	145,51	133,92	170,77	186,49	216,89
MCA		A	38,15	42,61	46,18	63,86	57,05	64,19	71,77	89,45	105,17	117,93
MOP		A	48,86	56,90	60,47	86,00	79,19	86,33	86,06	111,60	127,31	144,36
Recommended fuse		A	45,00	50,00	60,00	80,00	75,00	80,00	80,00	110,00	125,00	125,00
SYSTEM + DHW/SYSTEM LOW HEAD PUMPS												
LRA		A	105,95	107,95	111,53	148,38	143,09	150,23	140,16	177,89	193,61	224,01
MCA		A	41,35	45,81	49,38	67,06	61,77	68,91	78,01	96,57	112,29	125,05
MOP		A	52,06	60,10	63,67	89,20	83,91	91,05	92,30	118,72	134,43	151,48
Recommended fuse		A	50,00	60,00	60,00	80,00	80,00	90,00	90,00	110,00	125,00	150,00
SYSTEM + DHW/SYSTEM HIGH HEAD PUMPS												
LRA		A	107,05	109,05	112,63	149,48	145,49	152,63	143,20	180,05	195,77	226,17
MCA		A	42,45	46,91	50,48	68,16	64,17	71,31	81,05	98,73	114,45	127,21
MOP		A	53,16	61,20	64,77	90,30	86,31	93,45	95,34	120,88	136,59	153,64
Recommended fuse		A	50,00	60,00	60,00	90,00	80,00	90,00	90,00	110,00	125,00	150,00

Model			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
CHARGE												
Refrigerant R410A (circuit C1)	-	lb	21,4	26,5	26,5	30,9	30,0	30,9	57,3	57,3	57,3	97,0
Refrigerant R410A (circuit C2)	-	lb	21,4	26,5	26,5	30,9	27,3	27,3	57,3	57,3	57,3	97,0
Oil (circuit C1)	-	dm ³	1,8	3,4	3,4	3,4	3,6	6,8	6,8	6,8	6,8	6,8
Oil (circuit C2)	-	dm ³	1,8	1,8	3,4	3,4	3,4	3,4	6,8	6,8	6,8	6,8
COMPRESSORS												
Quantity / Circuits	-	n°/n°	2 / 2	2 / 2	2 / 2	2 / 2	3 / 2	3 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Capacity control	-											
EC INVERTER FANS												
Quantity	-	n°	8	8	8	8	2	2	3	3	3	4
Air flow	-	m ³ /h	44000	44000	44000	41000	45000	45000	68000	68000	68000	92000
Input power (230V)	-	kW	2,76	2,76	2,76	2,76	4,80	4,80	7,20	7,20	7,20	9,60
Input power (460/575V)	-	kW	2,76	2,76	2,76	2,76	5,12	5,12	7,68	7,68	7,68	10,24
Input current (230V)	-	A	17,60	17,60	17,60	17,60	15,00	15,00	22,50	22,50	22,50	30,00
Input current (460V)	-	A	17,60	17,60	17,60	17,60	7,80	7,80	11,70	11,70	11,70	15,60
Input current (575V)	-	A	17,60	17,60	17,60	17,60	6,24	6,24	9,36	9,36	9,36	12,48
SYSTEM SIDE HEAT EXCHANGER												
Quantity	-	n°	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Water content	-	dm ³	6,50	6,50	8,40	10,80	12,70	15,60	15,60	18,00	18,00	16,60
Water connections	-	inch	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"
SYSTEM SIDE (2 AND 4 PIPES) - HYDRONIC KIT												
STORAGE TANK												
Storage tank capacity	-	gal	79,3	79,3	79,3	79,3	132,1	132,1	132,1	132,1	132,1	184,9
EXPANSION VESSEL												
Quantity expansion vessel	-	n°	1	1	1	1	1	1	1	1	1	2
Content expansion vessel	-	gal	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3
Expansion vessel calibration	-	PSI	21,7	21,7	21,7	21,7	21,7	21,7	21,7	21,7	21,7	21,7
LOW STATIC HEAD PUMP												
Input power (230-460V)	-	kW	1,50	1,50	1,50	1,50	1,50	1,50	2,20	2,20	2,20	2,20
Input power (575V)	-	kW	1,10	1,10	1,10	1,10	1,10	1,10	2,20	2,20	2,20	2,20
Input current (230V)	-	A	7,50	7,50	7,50	7,50	7,50	7,50	7,80	7,80	7,80	7,80
Input current (460V)	-	A	4,30	4,30	4,30	4,30	4,30	4,30	3,90	3,90	3,90	3,90
Input current (575V)	-	A	1,60	1,60	1,60	1,60	1,60	1,60	3,10	3,10	3,10	3,10
HIGH STATIC HEAD PUMP												
Input power (230-460V)	-	kW	2,20	2,20	2,20	2,20	2,20	2,20	3,00	3,00	3,00	3,00
Input power (575V)	-	kW	1,50	1,50	1,50	1,50	2,20	2,20	3,00	3,00	3,00	3,00
Input current (230V)	-	A	7,80	7,80	7,80	7,80	7,80	7,80	10,00	10,00	10,00	10,00
Input current (460V)	-	A	4,50	4,50	4,50	4,50	4,50	4,50	5,00	5,00	5,00	5,00
Input current (575V)	-	A	2,20	2,20	2,20	2,20	3,10	3,10	4,00	4,00	4,00	4,00
SAFETY VALVE												
Safety valve	-	n°	1	1	1	1	1	1	1	1	1	1
Safety valve	-	PSI	87,0	87,0	87,0	87,0	87,0	87,0	87,0	87,0	87,0	87,0

Model			0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
DHW / SYSTEM SIDE HEAT EXCHANGER												
Quantity	-	n°	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00
Total water content	-	dm ³	5,00	5,00	5,00	8,60	8,60	8,60	8,60	11,00	19,00	19,00
Water connections	-	inch	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	2"½	3"
DHW SIDE (2 PIPES) / SYSTEM SIDE (4 PIPES) - HYDRONIC KIT												
EXPANSION VESSEL												
Expansion vessel	-	n°	1 / 24	1 / 24	1 / 24	1 / 24	1 / 24	1 / 24	1 / 24	1 / 24	1 / 24	2 / 24
Expansion vessel	-	gal	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3	6,3
Expansion vessel calibration	-	PSI	21,7	21,7	21,7	21,7	21,7	21,7	21,7	21,7	21,7	21,7
LOW STATIC HEAD PUMP												
Input power (230-460V)	-	kW	1,50	1,50	1,50	1,50	2,20	2,20	2,20	3,00	3,00	3,00
Input power (575V)	-	kW	1,10	1,10	1,10	1,10	2,20	2,20	2,20	3,00	3,00	3,00
Input current (230V)	-	A	7,50	7,50	7,50	7,50	7,80	7,80	7,80	10,00	10,00	10,00
Input current (460V)	-	A	4,30	4,30	4,30	4,30	3,90	3,90	3,90	5,00	5,00	5,00
Input current (575V)	-	A	1,60	1,60	1,60	1,60	3,10	3,10	3,10	4,00	4,00	4,00
HIGH STATIC HEAD PUMP												
Input power (230-460V)	-	kW	2,20	2,20	2,20	2,20	3,00	3,00	4,00	4,00	4,00	4,00
Input power (575V)	-	kW	1,50	1,50	1,50	1,50						
Input current (230V)	-	A	7,80	7,80	7,80	7,80	10,00	10,00	13,20	13,20	13,20	13,20
Input current (460V)	-	A	4,50	4,50	4,50	4,50	5,00	5,00	6,60	6,60	6,60	6,60
Input current (575V)	-	A	2,20	2,20	2,20	2,20	4,00	4,00	5,30	5,30	5,30	5,30
SAFETY VALVE												
Safety valve	-	n°	1	1	1	1	1	1	1	1	1	1
Safety valve	-	PSI	87,0	87,0	87,0	87,0	87,0	87,0	87,0	87,0	87,0	87,0
SOUND DATA (COOLING MODE)												
Sound power	E	dB	74	75	77	78	75	76	77	78	78	79
	A	dB	-	-	-	-	83	84	85	86	86	86
Sound pressure	E	dB	42	43	45	46	43	44	45	46	46	47
	A	dB	-	-	-	-	51	52	53	54	54	54
DIMENSIONS - WEIGHT												
Height	-	inch	63,2	63,2	63,2	63,2	73,8	73,8	73,8	73,8	73,8	77,8
Width	-	inch	43,3	43,3	43,3	43,3	43,3	43,3	43,3	43,3	43,3	59,1
Lenght	-	inch	126,0	126,0	126,0	126,0	131,6	131,6	170,9	170,9	170,9	210,8
Weight (empty unit)	-	lb	1948,9	2004,0	2061,3	2244,3	2464,8	2570,6	3209,9	3262,8	3406,1	4931,7

SOUND POWER

Aermec determines sound power values on the basis of measurements made in accordance with UNI EN ISO 9614-2, as required for Eurovent certification.

SOUND PRESSURE

Sound pressure in free field, at 10m / 32,8ft distance from the external surface of the unit (in accordance with UNI EN ISO 3744).

10. OPERATIONAL LIMITS

10.1. COOLING MODE

The units, in standard configuration, are not suitable for installation in salty environments.
For functioning limits, please refer to the diagrams, valid for Δt 5°C/10°F.

In summer mode, the unit can be started with external air 46°C/114,8°F and inlet water 35°C/95°F.
In winter and RECOVERY mode, the unit can be started with external air -15°C/5°F and inlet water 20°C/68°F.

In these conditions, operation is only allowed for a short amount of time and to bring the system to the proper temperature.

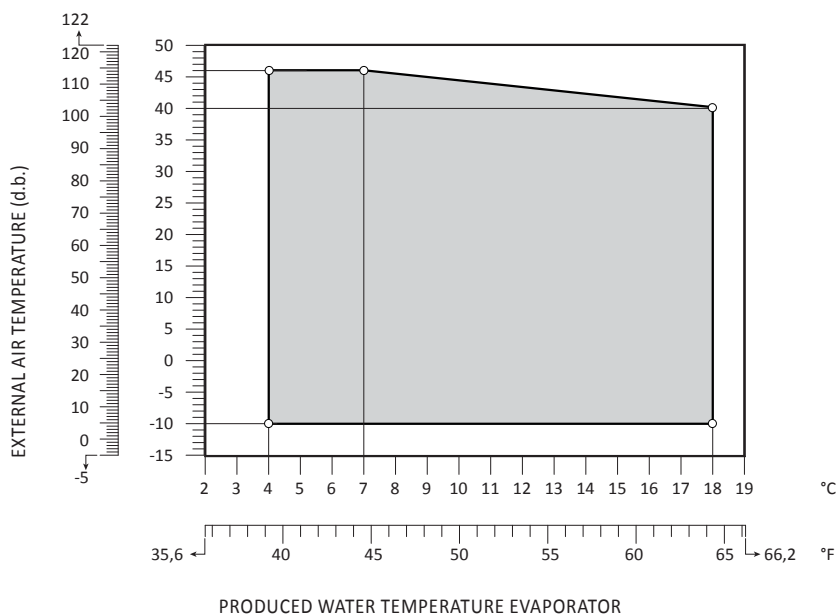
To shorten this operation, it is recommended to install a three-way valve which makes it possible to bypass the water from the utilities to the plant, until achieving conditions which allow the unit to work within the allowed operating limits.



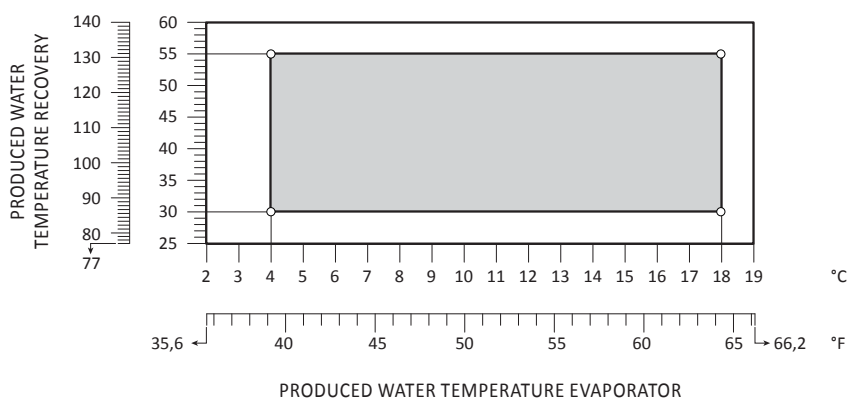
ATTENTION

In windy areas, for correct operation of condensing control it is recommended to install a windbreak barrier.
It should be installed if wind velocity is beyond 2,5 m/s.

COOLING MODE



CHILLER + TOTAL RECOVERY

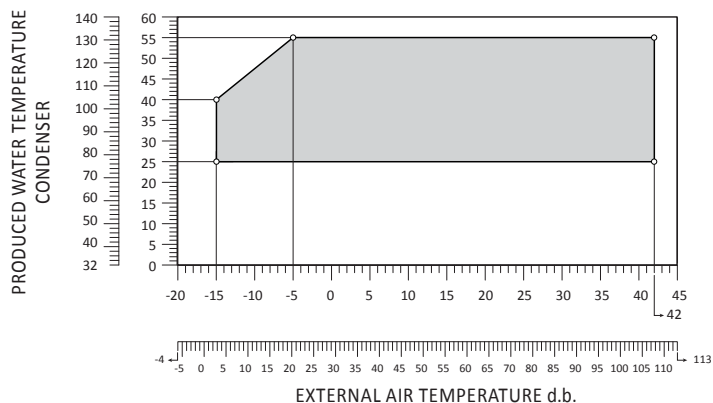


10.2. HEATING MODE

In summer mode, the unit can be started with external air 46°C/114,8°F and inlet water 35°C/95°F.
In winter and RECOVERY mode, the unit can be started with external air -15°C/5°F and inlet water 20°C/68°F.

In these conditions, operation is only allowed for a short amount of time and to bring the system to the proper temperature.

To shorten this operation, it is recommended to install a three-way valve which makes it possible to bypass the water from the utilities to the plant, until achieving conditions which allow the unit to work within the allowed operating limits.



11. CORRECTIVE FACTORS FOR DATA DIFFERENT THAN NOMINAL IN COOLING MODE

11.1. COOLING CAPACITY AND INPUT POWER

The refrigerating capacity yielded and the input electrical capacity in conditions other than rated conditions are obtained by multiplying the rated values (P_c , P_a) by the respective correction coefficients (C_f , C_a).

The diagram allows you to obtain the correction coefficients; corresponding to each curve, the temperature of the cold processed water referred to is reported, assuming a difference in water temperature between the input and output of the condenser equal to $5^\circ\text{C}/10^\circ\text{F}$.

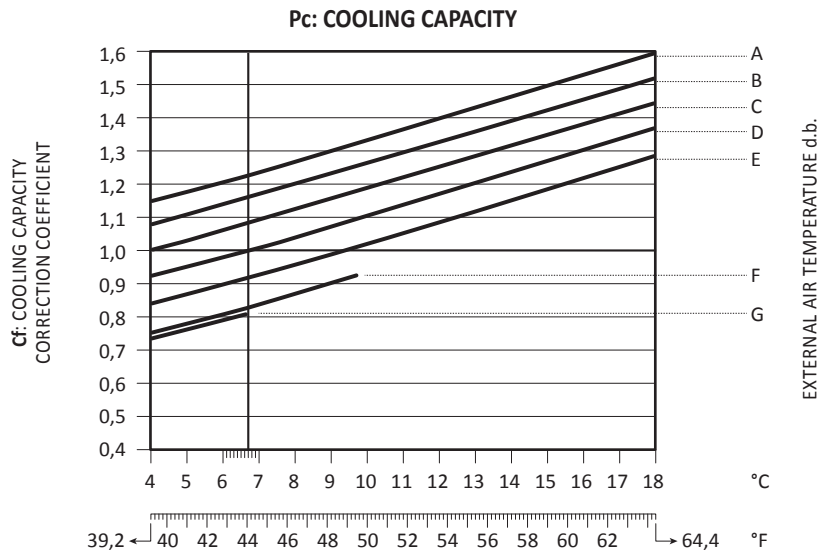
KEY:

P_c : Cooling capacity

P_a : Input power

C_f : Cooling capacity correction coefficient

C_a : Input power correction coefficient



11.2. FOR Δt DIFFERENT FROM THE RATED VALUE

For Δt different from 5K , refer to Tab.

" Δt DIFFERENT FROM NOMINAL ($\Delta t 5$)"
for the cooling capacity and input power correction factors.

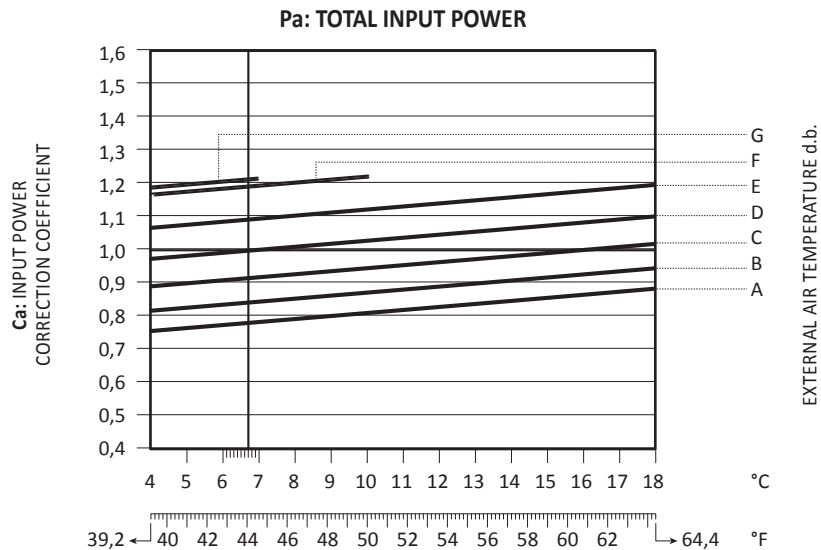
Δt DIFFERENT FROM NOMINAL ($\Delta t 5$)				
	3	5	8	10
Cooling capacity	0,99	1	1,02	1,03
Input power	0,99	1	1,01	1,02

11.3. FOULING FACTORS

The performance levels indicated in table: "**FOULING FACTOR $[\text{K}^*\text{M}^2]/[\text{W}]$** " refer to conditions with clean tubes, with a fouling factor = 1. For values different from the fouling factor, multiply the values in the performance table by the reported coefficients.

FOULING FACTOR $[\text{K}^*\text{M}^2]/[\text{KW}]$ correction factors			
	0,018	0,05	0,1
Cooling capacity	1	0,987	0,967
Input power	1	0,987	0,967

		A	B	C	D	E	F	G
Condenser output water temperature	$^\circ\text{C}$	20	25	30	35	40	45	46
	$^\circ\text{F}$	68	77	86	95	104	113	114,8



		A	B	C	D	E	F	G
Condenser output water temperature	$^\circ\text{C}$	20	25	30	35	40	45	46
	$^\circ\text{F}$	68	77	86	95	104	113	114,8

11.4. HEATING CAPACITY AND INPUT POWER

The heating capacity yielded and the input electrical capacity in conditions other than rated conditions are obtained by multiplying the rated values (Ph, Pa) by the respective correction coefficients (Ch, Ca).

The diagram allows you to obtain the correction coefficients; corresponding to each curve, the temperature of the hot processed water referred to is reported, assuming a difference in water temperature between the input and output of the condenser equal to 5°C/10°F.

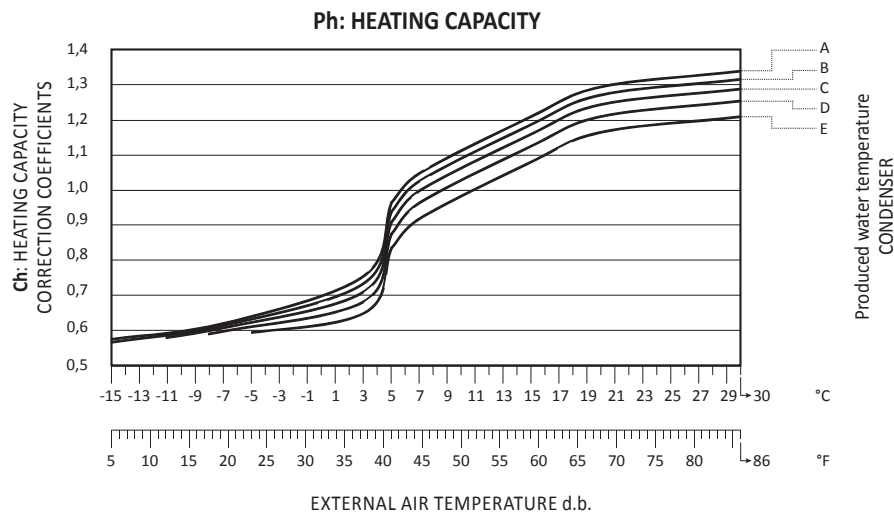
KEY:

Ph: Heating capacity

Pa: Input power

Ch: Heating capacity correction coefficient

Ca: Input power correction coefficient



11.5. FOR Δt DIFFERENT FROM THE RATED VALUE

For Δt different from 5K, refer to Tab.

“Δt DIFFERENT FROM NOMINAL (Δt 5)”
for the cooling capacity and input power correction factors.

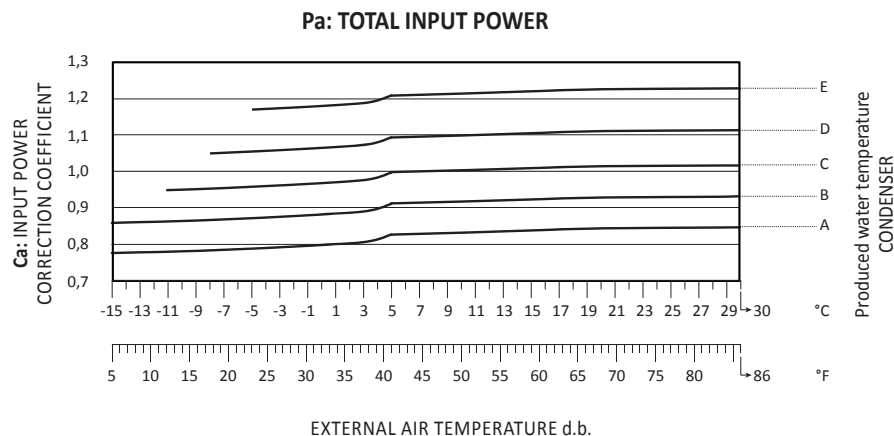
Δt DIFFERENT FROM NOMINAL (Δt 5)				
	3	5	8	10
Heating capacity	0,99	1	1,01	1,02
Input power	1,01	1	0,98	0,96

		A	B	C	D	E
Condenser utput water temeprature	°C	35	40	45	50	55
	°F	95	104	113	122	131

11.6. FOULING FACTORS

The performance levels indicated in table: **“FOULING FACTOR [K*M²]/[W]”** refer to conditions with clean tubes, with a fouling factor = 1. For values different from the fouling factor, multiply the values in the performance table by the reported coefficients.

FOULING FACTOR [K*M²]/[KW] correction factors			
	0,018	0,05	0,1
Cooling capacity	1	0,987	0,967
Input power	1	0,987	0,967



		A	B	C	D	E
Condenser utput water temeprature	°C	35	40	45	50	55
	°F	95	104	113	122	131

11.7. CORRECTIVE COEFFICIENTS OF RECOVERED HEATING CAPACITY

The refrigerating capacity yielded and the input electrical capacity in conditions other than rated conditions are obtained by multiplying the rated values (P_c , P_a) by the respective correction coefficients (C_f , C_a).

The diagram allows you to obtain the correction coefficients; corresponding to each curve, the temperature of the hot processed water referred to is reported, assuming a difference in water temperature between the input and output of the condenser equal to $5^\circ\text{C}/10^\circ\text{F}$.

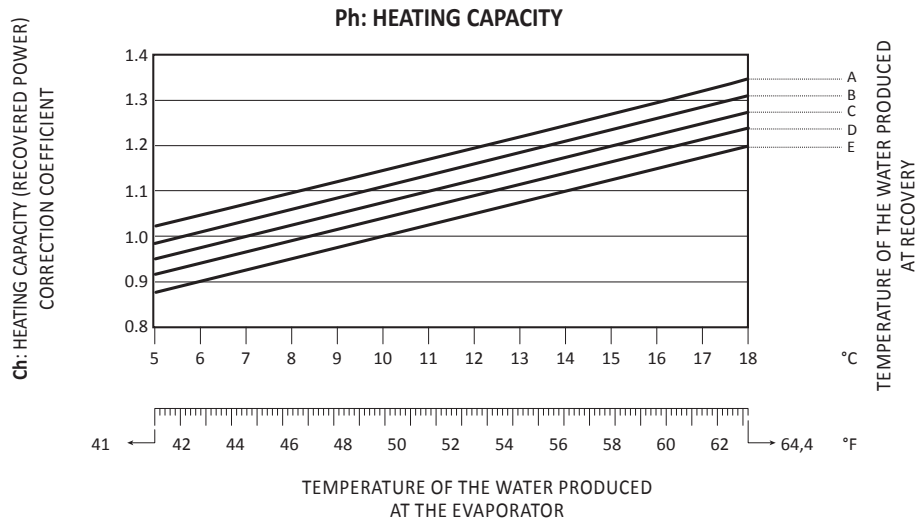
KEY:

Ph: Heating capacity

Pa: Input power

Ch: Heating capacity correction coefficient

Ca: Input power correction coefficient



11.8. FOR Δt DIFFERENT FROM THE RATED VALUE

For Δt different from 5K , refer to Tab.

" Δt DIFFERENT FROM NOMINAL ($\Delta t 5$)"

for the cooling capacity and input power correction factors.

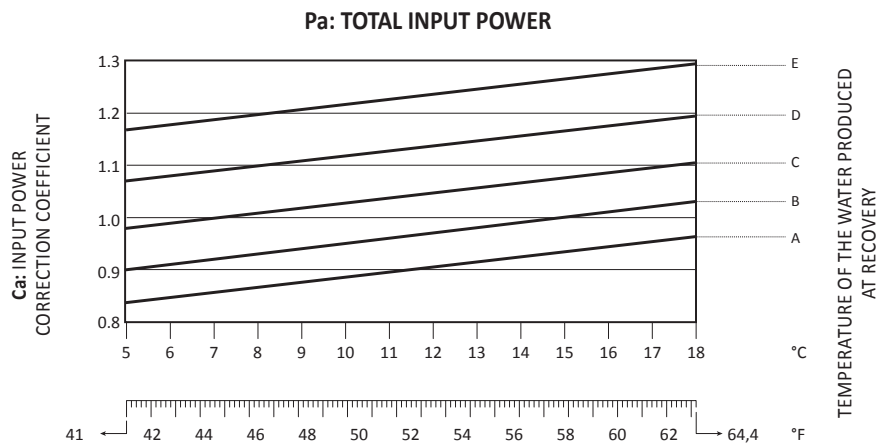
		A	B	C	D	E
Condenser output water temperature	$^\circ\text{C}$	35	40	45	50	55
	$^\circ\text{F}$	95	104	113	122	131

FOULING FACTOR $[\text{K}^2\text{M}^2]/[\text{KW}]$ correction factors			
	0,018	0,05	0,1
Cooling capacity	1	0,987	0,967
Input power	1	0,987	0,967

11.9. FOULING FACTORS

The performance levels indicated in table: **"FOULING FACTOR $[\text{K}^2\text{M}^2]/[\text{W}]$ "** refer to conditions with clean tubes, with a fouling factor = 1. For values different from the fouling factor, multiply the values in the performance table by the reported coefficients.

FOULING FACTOR $[\text{K}^2\text{M}^2]/[\text{KW}]$ correction factors			
	0,018	0,05	0,1
Cooling capacity	1	0,987	0,967
Input power	1	0,987	0,967

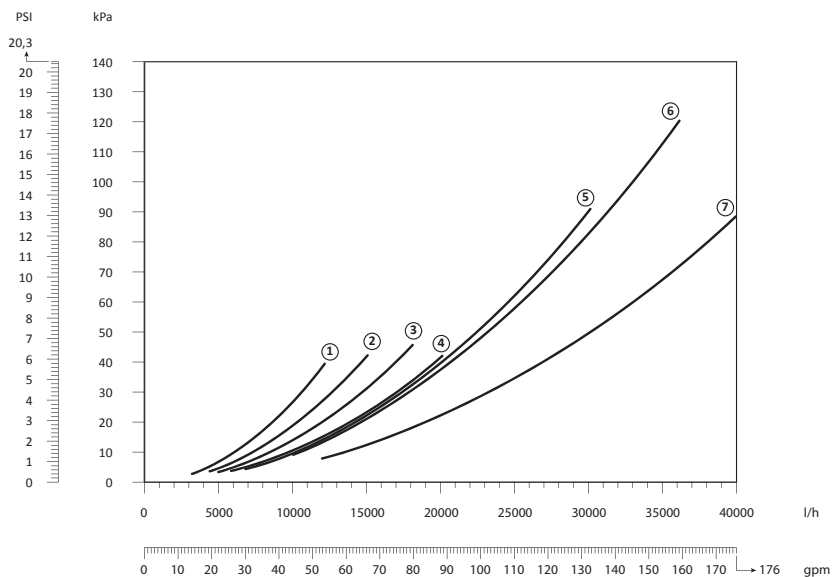


		A	B	C	D	E
Condenser output water temperature	$^\circ\text{C}$	35	40	45	50	55
	$^\circ\text{F}$	95	104	113	122	131

12. PRESSURE DROP

SYSTEM SIDE (EV) PRESSURE DROP COOLING MODE FUNCTIONING (2/4 PIPES)

The diagram pressure drop are related to an average water temperature of 10°C/50°F



Key:

NRP	
①	0280-0300
②	0330
③	0350
④	0500
⑤	0550-0600
⑥	0700
⑦	0750

Evaporator inlet water temperature 7°C/44,6°F
 Evaporator outlet water temperature 12°C/53,6°F
 External air temperature 35°C/95°F
 Average water temperature 10°C/50°F

For temperatures other than 10°C/50°F, use the corrective factors table.

Water flow rate MIN e MAX

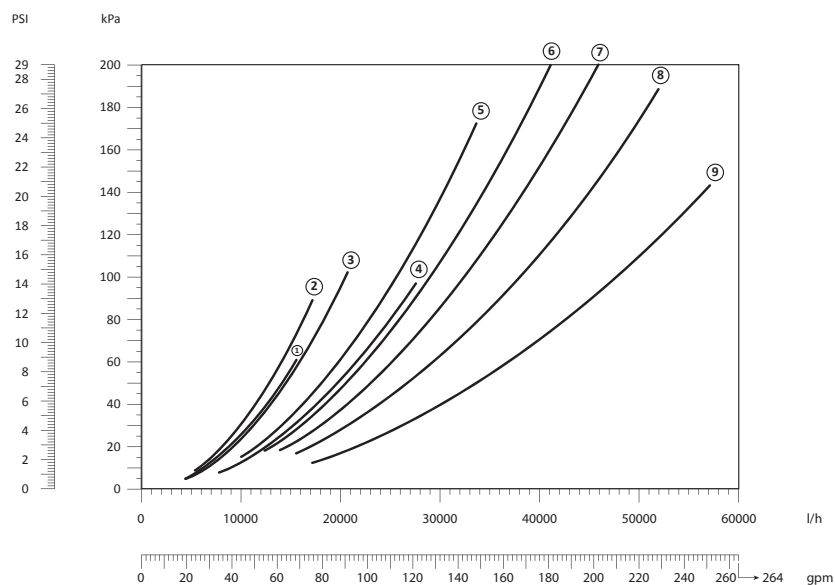
NRP			
Model	u.m.	MIN	MAX
NRP 280E	gpm	14,41	48,03
NRP 300E	gpm	16,94	56,47
NRP 330E	gpm	19,43	64,78
NRP 350E	gpm	24,08	80,26
NRP 500A	gpm	25,58	85,26
NRP 550A	gpm	29,77	99,24
NRP 600A	gpm	39,13	130,42
NRP 650A	gpm	43,51	145,04
NRP 700A	gpm	47,89	159,65
NRP 750A	gpm	53,85	179,50

CORRECTIVE FACTORS TABLE - EVAPORATOR

Average water temperature (°C / °F)	5/41	10/50	15/59	20/68	30/86	40/104	50/122
Multiplicative coefficients	1,02	1,00	0,98	0,97	0,95	0,93	0,91

RECOVERY MODE WITH DHW SIDE (2 PIPES) HOT WATER PRODUCTION SYSTEM SIDE (4 PIPES)

The diagram pressure drop are related to an average water temperature of 43°C/109,4°F



Key:

NRP	
①	0280
②	0300
③	0330
④	0350-0500
⑤	0550
⑥	0600
⑦	0650
⑧	0700
⑨	0750

Recovery inlet water temperature 40°C/104°F

Recovery outlet water temperature 45°C/113°F

Average water temperature 43°C/109,4°F

For temperatures other than 43°C/109,4°F, use the corrective factors table.

Water flow rate MIN e MAX

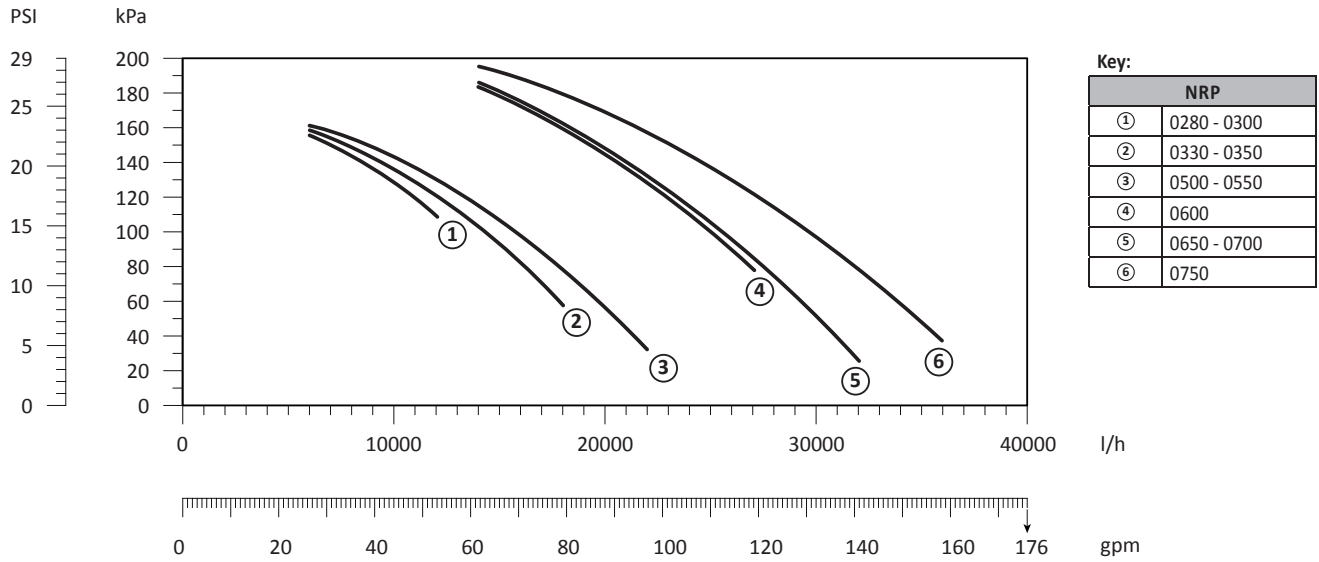
NRP			
Model	u.m.	MIN	MAX
NRP 280E	gpm	20,16	67,19
NRP 300E	gpm	23,82	79,40
NRP 330E	gpm	27,37	91,23
NRP 350E	gpm	34,69	115,65
NRP 500A	gpm	36,46	121,53
NRP 550A	gpm	44,50	148,32
NRP 600A	gpm	54,52	181,72
NRP 650A	gpm	61,73	205,77
NRP 700A	gpm	68,80	229,33
NRP 750A	gpm	75,58	251,93

CORRECTIVE FACTORS TABLE - EVAPORATOR

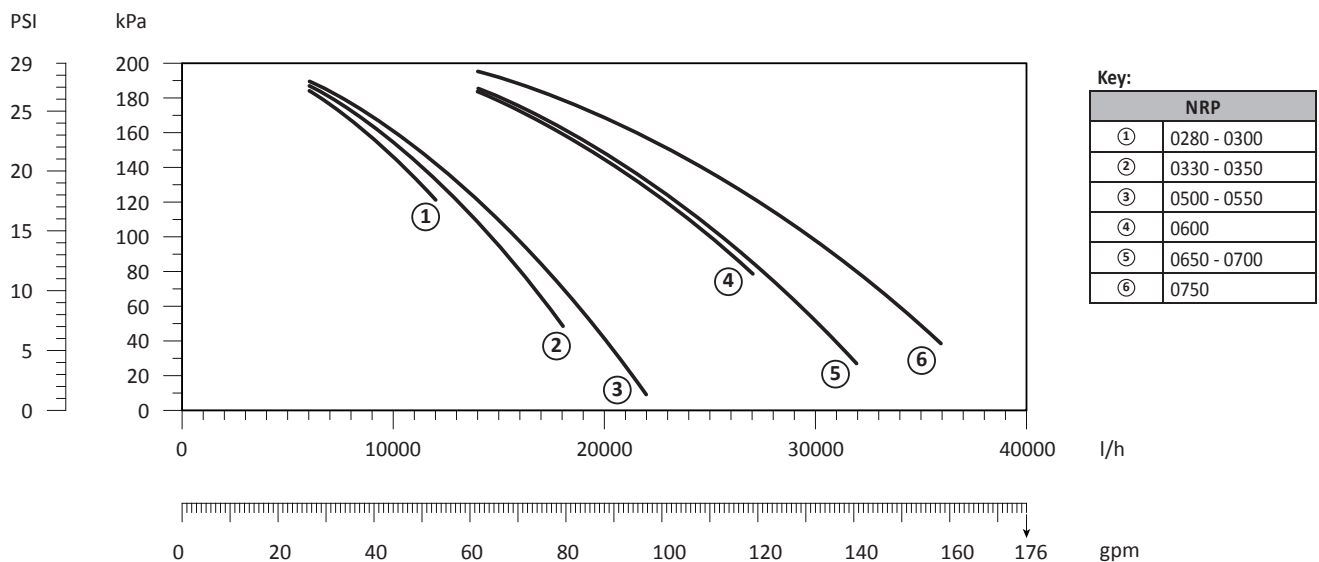
Average water temperature (°C / °F)	23/73,4	28/82,4	33/91,4	38/100,4	43/109,4	48/118,4	53/127,4	58/136,4
Multiplicative coefficients	1,04	1,03	1,02	1,01	1,00	0,99	0,98	0,97

13. USEFUL STATIC PRESSURES 2|4 PIPE SYSTEM

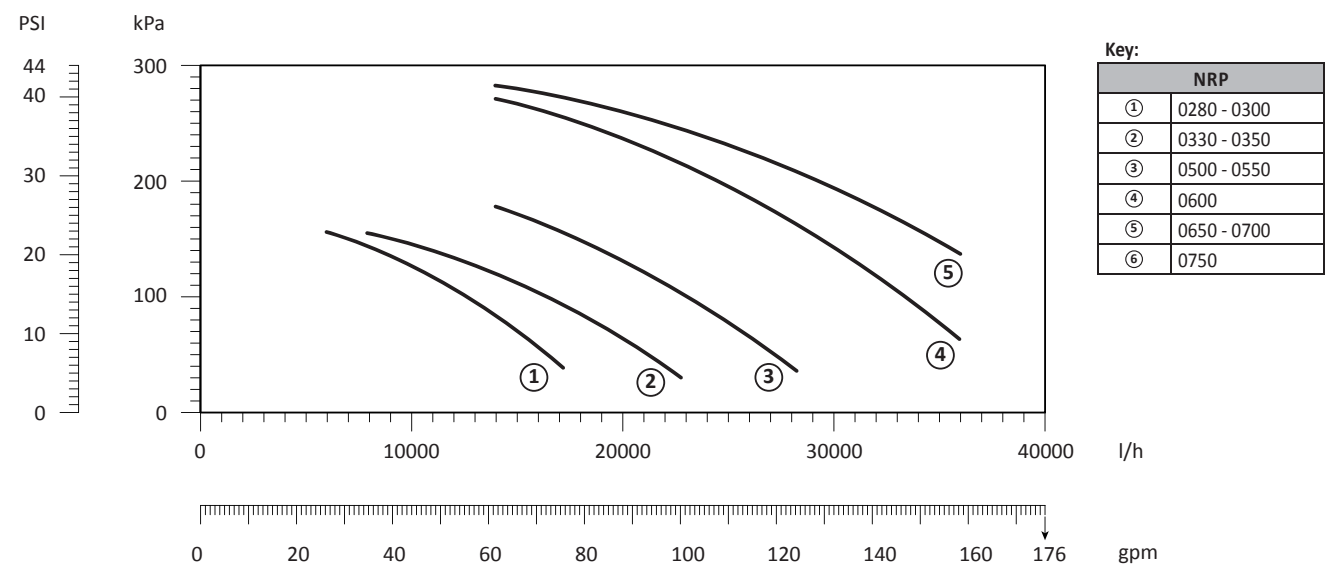
13.1. LOW STATIC PRESSURE PUMPS IN COOLING MODE - SYSTEM SIDE 230/460V



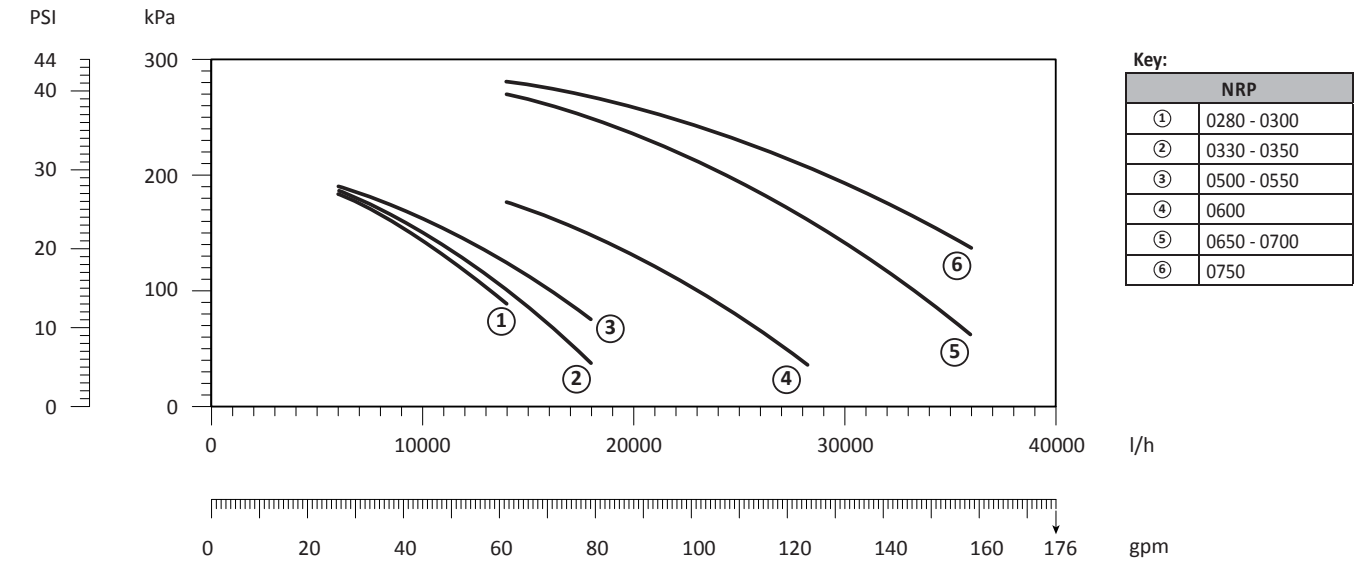
13.2. LOW STATIC PRESSURE PUMPS IN COOLING MODE - SYSTEM SIDE 575V



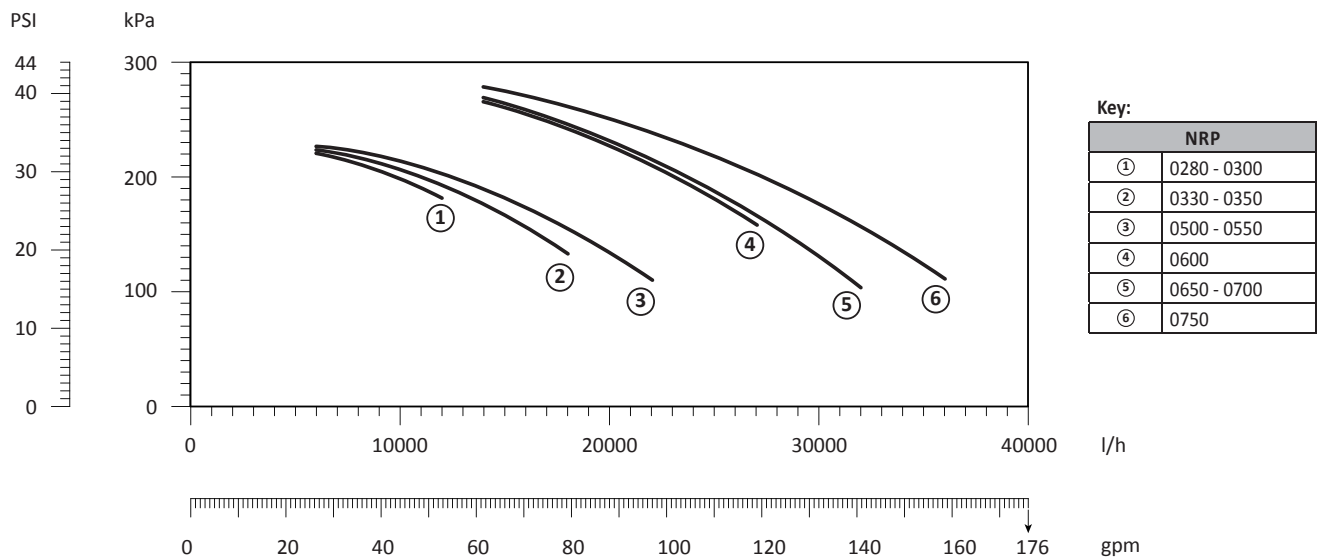
13.3. LOW STATIC PRESSURE PUMPS IN COOLING MODE - RECOVERY MODE 230/460V



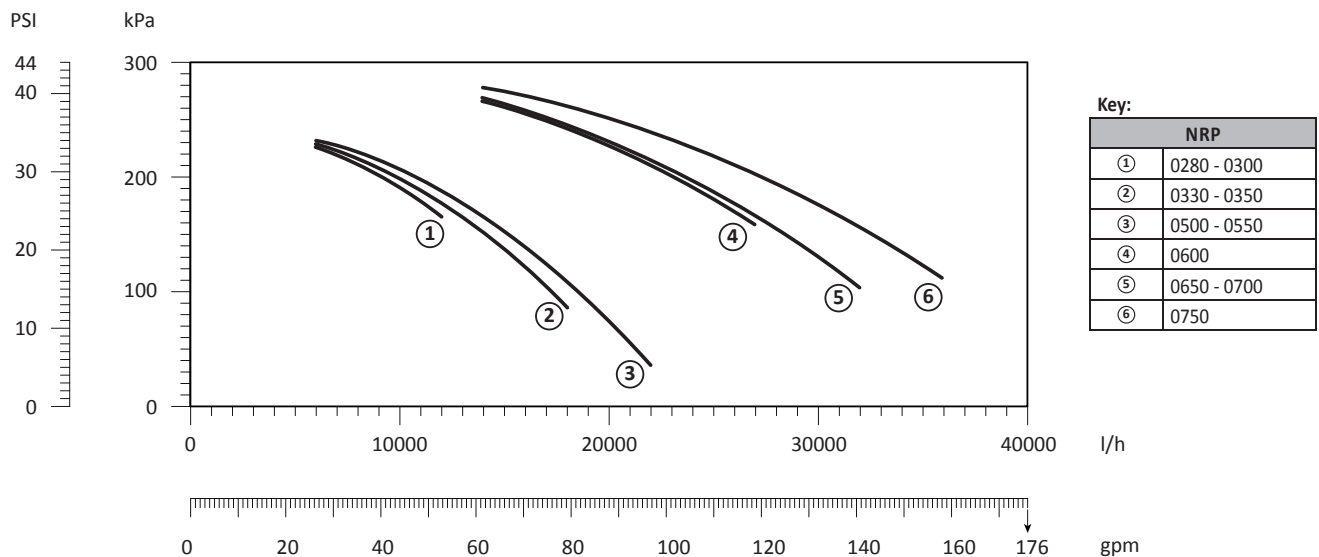
13.4. LOW STATIC PRESSURE PUMPS IN COOLING MODE - RECOVERY MODE 575V



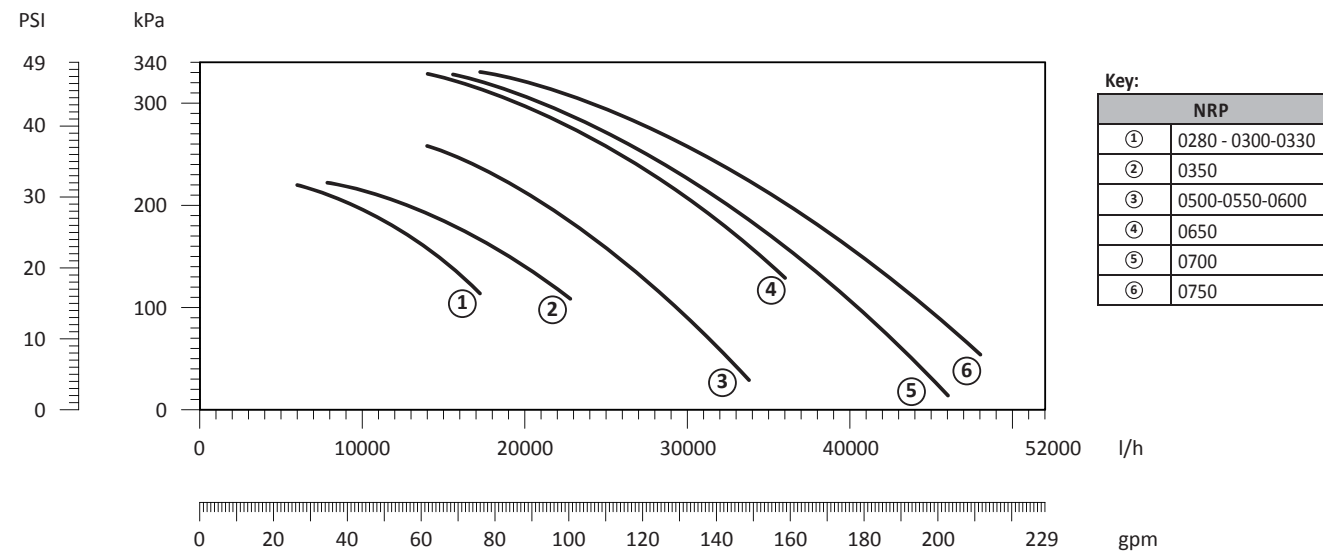
13.5. HIGH STATIC PRESSURE PUMPS IN COOLING MODE - SYSTEM SIDE 230/460V



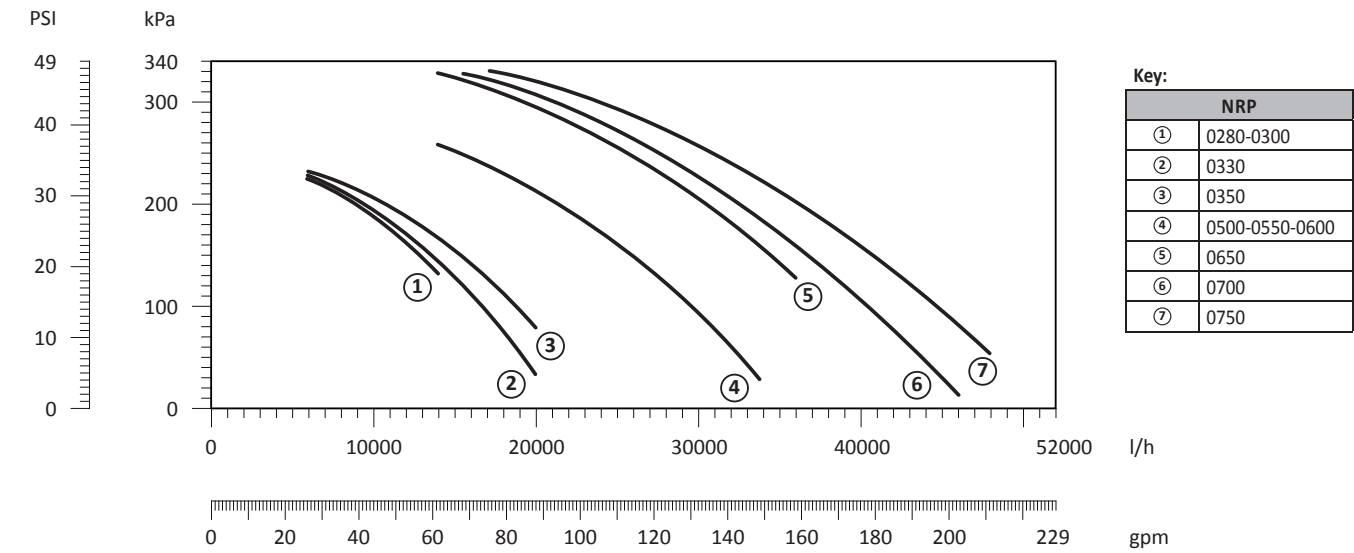
13.6. HIGH STATIC PRESSURE PUMPS IN COOLING MODE - SYSTEM SIDE 575V



13.7. HIGH STATIC PRESSURE PUMPS IN COOLING MODE - RECOVERY MODE 230/460V



13.8. HIGH STATIC PRESSURE PUMPS IN COOLING MODE - RECOVERY MODE 575V



14. EXPANSION VESSEL CALIBRATION

14.1. EXPANSION VESSEL CALIBRATION

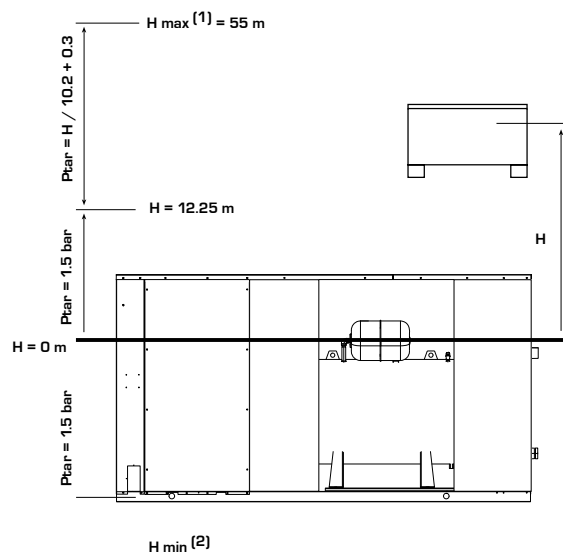
Standard pre-load pressure value of the expansion vessel is 1,5bar/21,8PSI, whereas volume is 24 litres. Maximum pressure 6bar/87PSI.

Calibration of the vessel must be regulated using the maximum level difference (H) of the user (see diagram) by using the following formula:

$$p \text{ (calibration) [bar]} = H \text{ [m]} / 10.2 + 0.3.$$

For example: if level difference (H) is equal to 20m/65,6ft, the calibration value of the vessel will be 2,3bar/33,4PSI.

If calibration value obtained from formula is less than 1,5bar/21,8PSI (that is for $H < 12.25$), keep calibration as standard.



KEY

- (1) Check that highest installation is not higher than 55 metres.
- (2) Ensure that lowest installation can withstand global pressure in that position.

15. MINIMUM WATER CONTENT

NRP		0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
Number of compressors	n°	2	2	2	2	3	3	4	4	4	4
Minimum water content admitted COLD SIDE	gal/ton	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
Minimum water content admitted the HOT SIDE	gal/ton	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3
Recommended water content COOLING SIDE HEATING SIDE		gal/ton	13,0	13,0	13,0	13,0	13,0	13,0	13,0	13,0	13,0



ATTENTION

It is recommended to design systems with high water content (minimum recommended values shown in table), to limit:

1. The hourly number of inversions between functioning modes.
2. Decrease in water temperature during winter defrost cycles.

16. ETHYLENE GLYCOL

COOLING MODE - CORRECTION FACTOR WITH ETHYLENE GLYCOL												
Freezing Point	°C/°F	0/32	-5/23	-7/19,4	-10/14	-13/8,6	-15/5	-20/-4	-25/-13	-30/-22	-37/-34,6	-44/-47,2
Percent ethylene glycol	%	0	12	15	20	25	30	35	40	45	50	55
Qw	-	1,00	1,052	1,066	1,088	1,111	1,133	1,155	1,177	1,199	1,220	1,242
Pc	-	1,000	0,988	0,985	0,980	0,975	0,970	0,965	0,960	0,955	0,950	0,945
Pa	-	1,000	0,995	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980	0,978
Dp	-	-	1,103	1,159	1,222	1,292	1,368	1,452	1,541	1,637	1,740	1,849

HEATING MODE - CORRECTION FACTOR WITH ETHYLENE GLYCOL												
Freezing Point	°C/°F	0/32	-5/23	-7/19,4	-10/14	-13/8,6	-15/5	-20/-4	-25/-13	-30/-22	-37/-34,6	-44/-47,2
Percent ethylene glycol	%	0	10	15	20	25	30	35	40	45	50	55
Qw	-	1,000	1,029	1,045	1,064	1,085	1,107	1,131	1,156	1,184	1,213	1,244
Ph	-	-	-	-	-	-	-	-	-	-	-	-
Pa	-	1,000	1,002	1,003	1,004	1,005	1,007	1,008	1,010	1,012	1,015	1,018
Dp	-	-	1,047	1,078	1,114	1,158	1,209	1,268	1,336	1,413	1,501	1,599

Qw: Corrective factor of flow rates (middle water temperatur 9,5°C/49,1°F)

Pc: Corrective factor of cooling capacity

Ph: Corrective factor of heating capacity

Pa: Corrective factor of input power

Dp: Corrective factor of pressure drop

17. PROPYLENIC GLYCOL

COOLING MODE - CORRECTION FACTOR WITH PROPYLENIC GLYCOL												
Freezing Point	°C/°F	0/32	-5/23	-7/19,4	-10/14	-13/8,6	-15/5	-20/-4	-25/-13	-30/-22	-37/-34,6	-44/-47,2
Percent propylenic glycol	%	0	10	15	20	25	30	35	40	45	50	55
Qw	-	1,000	1,019	1,028	1,038	1,048	1,058	1,068	1,078	1,089	1,099	1,110
Pc	-	1,000	0,985	0,978	0,970	0,963	0,955	0,947	0,939	0,932	0,924	0,916
Pa	-	1,000	0,996	0,994	0,992	0,990	0,988	0,986	0,984	0,982	0,980	0,978
Dp	-	-	1,039	1,065	1,126	1,218	1,339	1,485	1,655	1,846	2,055	2,279

HEATING MODE - CORRECTION FACTOR WITH PROPYLENIC GLYCOL												
Freezing Point	°C/°F	0/32	-5/23	-7/19,4	-10/14	-13/8,6	-15/5	-20/-4	-25/-13	-30/-22	-37/-34,6	-44/-47,2
Percent propylenic glycol	%	0	10	15	20	25	30	35	40	45	50	55
Qw	-	1,000	1,011	1,020	1,030	1,043	1,057	1,073	1,092	1,113	1,136	1,162
Ph	-	-	-	-	-	-	-	-	-	-	-	-
Pa	-	1,000	1,003	1,004	1,005	1,007	1,009	1,011	1,014	1,018	1,023	1,029
Dp	-	-	1,047	1,078	1,114	1,158	1,209	1,268	1,336	1,413	1,501	1,599

Qw: Corrective factor of flow rates (middle water temperatur 9,5°C/49,1°F)

Pc: Corrective factor of cooling capacity

Ph: Corrective factor of heating capacity

Pa: Corrective factor of input power

Dp: Corrective factor of pressure drop

18. SOUND DATA

SOUND POWER:

Aermec determines sound power values on the basis of measurements made in accordance with UNI EN ISO 9614-2, as required for Eurovent certification.

SOUND PRESSURE:

Sound pressure in free field, at 10 m/ 393,7in distance from the external surface of the unit (in accordance with UNI EN ISO 3744)

COOLING MODE

The 'E' version is low noise with temperature
12/7°C -35°C
53,6/44,6°C - 95°F

HEATING MODE

The 'E' version is low noise with temperature
> 25°C
> 77°F

NRP	VERS.	Total sound levels			Octave band[Hz]						
		Pot. [dB (A)]	Pressure		125	250	500	1000	2000	4000	8000
			[dB (A)] 10m 32,8ft	[dB (A)] 1 m 3,3ft	Sound power by central band frequency [dB (A)]						
HEATING MODE FUNCTIONING											
280	E	74	42	54	72,2	61,1	66,4	63,5	61,0	50,0	43,7
300	E	76	44	56	74,1	63,2	68,1	65,3	63,0	52,0	45,5
330	E	77	45	57	75,1	64,0	69,1	66,3	64,1	53,3	46,8
350	E	78	46	58	76,1	65,0	70,1	67,6	64,6	55,0	47,1
500	A	83	51	63	69,1	70,8	75,0	77,7	77,5	75,1	64,8
550	A	84	52	64	70,1	71,9	77,0	79,5	78,5	74,0	63,0
600	A	85	53	65	71,9	74,4	77,8	80,7	79,4	75,0	62,9
650	A	86	54	66	72,4	73,6	78,1	80,9	81,0	77,6	67,1
700	A	86	54	66	73,9	74,2	79,0	79,3	81,0	77,6	66,2
750	A	87	55	67	74,8	75,3	80,1	80,5	82,0	78,2	67,2
500	E	75	43	55	61,9	64,9	67,9	69,8	68,1	64,3	57,9
550	E	76	44	56	63,4	66,6	70,1	70,8	69,2	65,3	58,9
600	E	77	45	57	64,6	68,1	71,2	71,9	70,2	66,5	60,4
650	E	78	46	58	65,1	68,1	71,5	72,1	71,4	68,5	64,5
700	E	78	46	58	66,7	68,6	69,6	70,8	72,4	66,7	63,0
750	E	79	47	59	67,9	69,9	70,8	71,8	73,2	67,5	63,9
COOLING MODE FUNCTIONING											
280	E	74	42	54	72,2	61,1	66,4	63,5	61,0	50,0	43,7
300	E	75	43	55	73,0	62,5	67,5	64,4	62,5	51,2	45,0
330	E	77	45	57	75,1	64,0	69,1	66,3	64,1	53,3	46,8
350	E	78	46	58	76,1	65,0	70,1	67,6	64,6	55,0	47,1
500	A	83	51	63	69,1	70,8	75,0	77,7	77,5	75,1	64,8
550	A	84	52	64	70,1	71,9	77,0	79,5	78,5	74,0	63,0
600	A	85	53	65	71,9	74,4	77,8	80,7	79,4	75,0	62,9
650	A	86	54	66	72,4	73,6	78,1	80,9	81,0	77,6	67,1
700	A	86	54	66	73,9	74,2	79,0	79,3	81,0	77,6	66,2
750	A	86	54	66	73,9	74,2	79,0	79,3	81,0	77,6	66,2
500	E	75	43	55	61,9	64,9	67,9	69,8	68,1	64,3	57,9
550	E	76	44	56	63,4	66,6	70,1	70,8	69,2	65,3	58,9
600	E	77	45	57	64,6	68,1	71,2	71,9	70,2	66,5	60,4
650	E	78	46	58	65,1	68,1	71,5	72,1	71,4	68,5	64,5
700	E	78	46	58	66,7	68,6	69,6	70,8	72,4	66,7	63,0
750	E	79	47	59	67,9	69,9	70,8	71,8	73,2	67,5	63,9

19. CONTROL AND SAFETY PARAMETERS CALIBRATION

COOLING SET	Min	Max.	Default
Water inlet temperature in cooling mode	-10°C / 14°F	20°C / 68°F	7°C / 44,6°F
HEATING SET	Min	Max.	Default
Inlet water temperature in heating functioning mode	30°C / 86°F	55°C / 131°F	50°C / 122°F
ANTI-FREEZE INTERVENTION	Min	Max.	Default
Intervention temperature of the anti-freeze alarm on the EV side (water outlet temperature)	-15°C / 5°F	4°C / 39,2°F	3°C / 37,4°F
TOTAL DIFFERENTIAL	Min	Max.	Default
Proportional temperature band within which the compressors are activated and deactivated	3°C / 5,4	10°C / 18	5°C / 10
Autostart	Auto		

NRP	U.M.	0280	0300	0330	0350	0500	0550	0600	0650	0700	0750
HIGH PRESSURE PRESSURE SWITCH MANUAL REARM											
PA	psi / bar	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40	580 / 40
HIGH PRESSURE TRANSDUCER											
TAP	psi / bar	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39	566 / 39
LOW PRESSURE TRANSDUCER											
TBP	psi / bar	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2	29 / 2
COOLING CIRCUIT SAFETY VALVES											
AP (High pressure)	psi / bar	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45	653 / 45
BP (Low pressure)	psi / bar	435 / 30	435 / 30	435 / 30	435 / 30	435 / 30	435 / 30	435 / 30	435 / 30	435 / 30	435 / 30

20. PART LOAD

HEATING (AHRI CONDITIONS)

Inlet water temperature	40°C / 104°F
Outlet water temperature	45°C / 113°F
External air temperature	7°C_44.6°F B.S. / 6°C_42.8°F B.U.

COOLING (AHRI CONDITIONS)

Outlet water temperature	6,7°C / 44,6°F
Flow rate	0,043l/s per kW
External temperature	35°C / 95°F

NRP		LEVELS OF POWER			
COOLING CAPACITY %	1%	2%	3%	4%	
0280	55	100	-	-	
0300	55	100	-	-	
0330	55	100	-	-	
0350	55	100	-	-	
0500	40	75	100	-	
0550	36	68	100	-	
0600	25	50	75	100	
0650	28	50	78	100	
0700	25	50	75	100	
0750	27	53	77	100	
POWER INPUT %	1%	2%	3%	4%	
0280	45	100	-	-	
0300	45	100	-	-	
0330	45	100	-	-	
0350	45	100	-	-	
0500	30	65	100	-	
0550	26	58	100	-	
0600	20	45	70	100	
0650	23	45	73	100	
0700	20	45	70	100	
0750	23	47	73	100	
HEATING CAPACITY %	1%	2%	3%	4%	
0280	50	100	-	-	
0300	50	100	-	-	
0330	50	100	-	-	
0350	50	100	-	-	
0500	35	70	100	-	
0550	31	63	100	-	
0600	23	48	73	100	
0650	25	47	75	100	
0700	23	48	73	100	
0750	25	47	75	100	
POWER INPUT %	1%	2%	3%	4%	
0280	45	100	-	-	
0300	45	100	-	-	
0330	45	100	-	-	
0350	45	100	-	-	
0500	30	65	100	-	
0550	26	58	100	-	
0600	20	45	70	100	
0650	23	45	73	100	
0700	20	45	70	100	
0750	23	47	73	100	



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